



Sustainable Food Supply

the case of the Roslagslådan network

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*Uthållig livsmedelsdistribution
-fallet Roslagslådan*

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Abstract

The large-scale, 'conventional', agro-industry food system has come under attack from supporters of the concept of Sustainable Development. Critics of 'conventional' food supply systems claim that the use of high-volume, intensified production processes and global markets, transport and distribution channels lead to economic and social marginalisation and degrade natural environments – conditions that are unsustainable in the long term. There has been much recent academic literature discussing the growth of Alternative Food Supply (AFS) as a sustainable solution to the food supply chain concerns raised about 'conventional' agriculture. However, the academic world remains largely in conflict over just how such claims manifest in reality. With reference to these theoretical claims, this project aims to explore the extent to which an AFS system contributes to Sustainable Development at the firm level, with respect to economic, social and environmental sustainability parameters. This project draws on qualitative data from case research of a small-scale, local, organic vegetable delivery box network in Sweden. Based on set criteria, the economic, social and environmental sustainability of the system is analysed, with a focus on the economic. Main results show that at the firm level the studied AFS network creates a sustainable flow of income for suppliers by creating greater market access temporally and geographically. Structural weaknesses in the network, however, threaten its perpetuation if external or internal conditions would change. Higher-level industry and political conditions also threaten the sustainability of the studied AFS network. The paper also highlights key strengths and weaknesses of attempting to holistically analyse sustainability, and wider industry implications for policy makers and, indirectly, consumers.

Key terms: food supply, sustainable food networks, sustainable development, business development, Sweden.

Abbreviations

AFS	Alternative Food Supply
CAP	Common Agricultural Policy (European Commission)
EC	European Commission
EU	European Union
IFOAM	International Federation of Organic Agriculture Movement
SD	Sustainable Development (as a concept)
SFSC	Short Food Supply Chains

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1. Introduction

Since the nineteen fifties concern has been voiced for the effects of human activity on the environment. By 1987 such concerns led to the international report, *Our Common Future*, coining the concept of Sustainable Development (Brundtland, 1987). This concept manifested the rising fears that humanity's social and economic paths were threatening its own existence - largely via significant environmental degradation and sustained social inequalities. The Brundtland report attempted to marry economic and social aims with the capacity of the natural environment, purporting to restructure society for self-preservation within the environment's regenerative capacity. Twenty years later, the Sustainable Development concept is still a burning topic and has become a key decision-making determinant for policy makers in many industries at the local, national and international scale - in particular, the agricultural sector (Pacini et al., 2004). By the second half of the twentieth century the agricultural sector was firmly entrenched in the food supply system referred to as 'conventional' - dominated by intensified, large-scale, globalised food production and trade. Such a structure led to increased profits for many producers and cheaper food for many consumers, while other sections of the agricultural industry – and society – were left marginalised as smaller-scale food producers were unable to compete, and parts of society were left unsatisfied with the food quality and environmental impact resulting from the 'conventional' system (European Commission, 2007; Allen et al, 2003; Dantsis et al, 2009). Food is imperative for human survival. Food is also emotional, as mealtime offers opportunities for people to connect socially and the making and eating of food is firmly entrenched in many cultures throughout the world (Maxey, 2006). Current food production, distribution, pricing, and quality standards entangle its systems in complicated situations, which have significant implications for economic, social and environmental sustainability – at both the large and global, agro-industry scale, and the small, local, 'alternative' agriculture scale.

1.1. Problem background

The large-scale, 'conventional', agro-industry food system has come under attack from supporters of the concept of Sustainable Development. Critics of 'conventional' food supply systems claim that the use of high-volume, intensified production processes and global markets, transport and distribution channels lead to economic and social marginalisation and degradation of natural environments – conditions that are unsustainable in the long term. There has been some recent literature discussing the growth of Alternative Food Supply (AFS) as counter-movements of larger, global-scale food production (Curtis, 2003; Kroma, 2006; Marsden & Smith, 2005). These 'alternative' strategies focus on a move towards locally-spaced network distribution, claiming that such activity finds new profitable niche markets as some consumers are beginning to value traceability and production quality of food over cheaper food grown and processed at unknown sources around the globe. AFS systems potentially enable farmers to capture such local markets to expand and diversify their business activity, while supporting sustainable rural and agricultural development in terms of environmental and socio-economic terms.

AFS is used as an umbrella term for a range of activities that claim to enable rural food producers to capture larger portions of the value chain (Marsden & Smith, 2005; Renting et al, 2003) than is possible when participating in large-scale agro-industrial operations. This is perceived to bring benefits both at the operational level by reducing transactional costs and the 'middle man' via Short Food Supply Chains (SFSC), direct-selling, Farmers markets and Community Supported Agriculture (CSA) where producers have direct contacts with consumers. Such activities are purported to strengthen the competitiveness of small-scale producers against large scale producers (Oerlemans & Assouline, 2003; Verhaegan & van Heulenbroeck, 2001; Renting et al, 2003). Additionally from a marketing perspective, value can be added to by methods of 'localisation', 'provenance' and 'labelling', highlighting unique 'qualities' of a product such as its geographical origin (e.g. wine from France, cheese from Italy or wool from Götland), and the consumer-perceived benefits of organic farming or artisan production (La Trobe & Acott, 2001; Selfa & Qazi, 2004). In the literature, terms used to describe different types of AFS have significantly overlapping features and it is not clearly defined what each are or are not. Different forms of AFS can operate along a broad spectrum from 'weakly' alternative to 'strongly' alternative, with sometimes contradicting values and ideologies (Follett, 2008). Therefore, simply defining an AFS is a problem in the field in addition to making theoretical assumptions about its social, economic and environmental effect.

As is explained in detail in the literature review, many of the benefits heralded by supporters of AFS theory come under dispute – for a range of reasons. Relative to the amount of discussion occurring, there is very little empirical research attempting to match reality with the claims put forth (Alkon, 2008; Holloway et al, 2006; Nousainen et al, 2009). Much more data collection must be done before grounded theory can be agreed upon.

The question of sustainability in food systems is a long argued topic within academia, with many contradicting arguments. More exploratory case research is needed to formulate clearer and more sound evidence upon which theory and rural development policy can be based. Therefore, closing these gaps is of interest to the theoretical world, rural development policy makers and, indirectly, consumers.

1.2. Aim

With reference to theoretical claims, this paper aims to explore the extent to which an AFS system such as a direct-selling SFSC contributes to Sustainable Development, with a focus on the economic. To do this, the case of Roslagslådan - a local, 'organic' vegetable box delivery network – will be analysed with respect to its economic, social and environmental sustainability at the firm level.

This paper focuses on the economic sustainability of the system. Understanding how the system affects social and environmental aspects is however still vital when taking an holistic Sustainable Development viewpoint. Key social and environmental aspects of this food supply network will therefore also be raised and discussed. While the concept of

Sustainable Development explicitly states the importance of balanced weighting between all pillars of sustainability, an aim focused more towards one discipline enables greater depth in analysis given the project scope limitations. SD largely calls for balanced interdisciplinary research but while interdisciplinarity is a popular catch phrase in research and industry alike, it is rarely – or slowly – adopted as a scientific research method (Stehr & Weingart, 2000). A subtle focus towards one particular field (economic) while simultaneously introducing and considering the relevance of other disciplines (social and environmental) can help pave the way for future, deeper and more balanced interdisciplinary research.

This project is linked to research by SLU's Energi och Teknik department, conducting a study on the logistics of local food production and delivery systems including environmental impacts.

The case of Roslagslådan will be analysed in relation to a set of parameters based on normative descriptions of economic, social and environmental sustainability outlined in published literature. Describing and analysing in detail this contextual situation will hopefully contribute relevant data in a new field of thought upon which more stable theory can be based. A deeper and more detailed understanding of AFS in the context of Sustainable Development will not only assist small-scale food producers in sustaining production and competitiveness, but also enable decision makers to create more effective food supply policy and enable the public to make more informed consumption choices.

1.3 Delimitations

Modern food systems are closely intertwined. Networks, by definition, are highly contextual and inter-linked, flexible and often informally contracted making it difficult to define clear boundaries between industry actors (Dantsis et al, 2009; Eng, 2005; Halinen, 2005). Therefore it is important that the scope of the case on hand is clearly defined for coherence, effective analysis and to adhere to time and resource limitations of the study. Figure 1 is adapted from Dantsis et al (2009) in their representation of the current complex and interconnected agro-industrial food supply system. Dantsis et al (2009) argue that even if producers claim strict 'local-ness' or 'alternativeness' in their food production and supply, it is very difficult for systems to be entirely isolated from the global, 'conventional' agro-industry. Rather, small-scale and alternative systems tend to dip in and out of the 'conventional' system at different points in the chain.

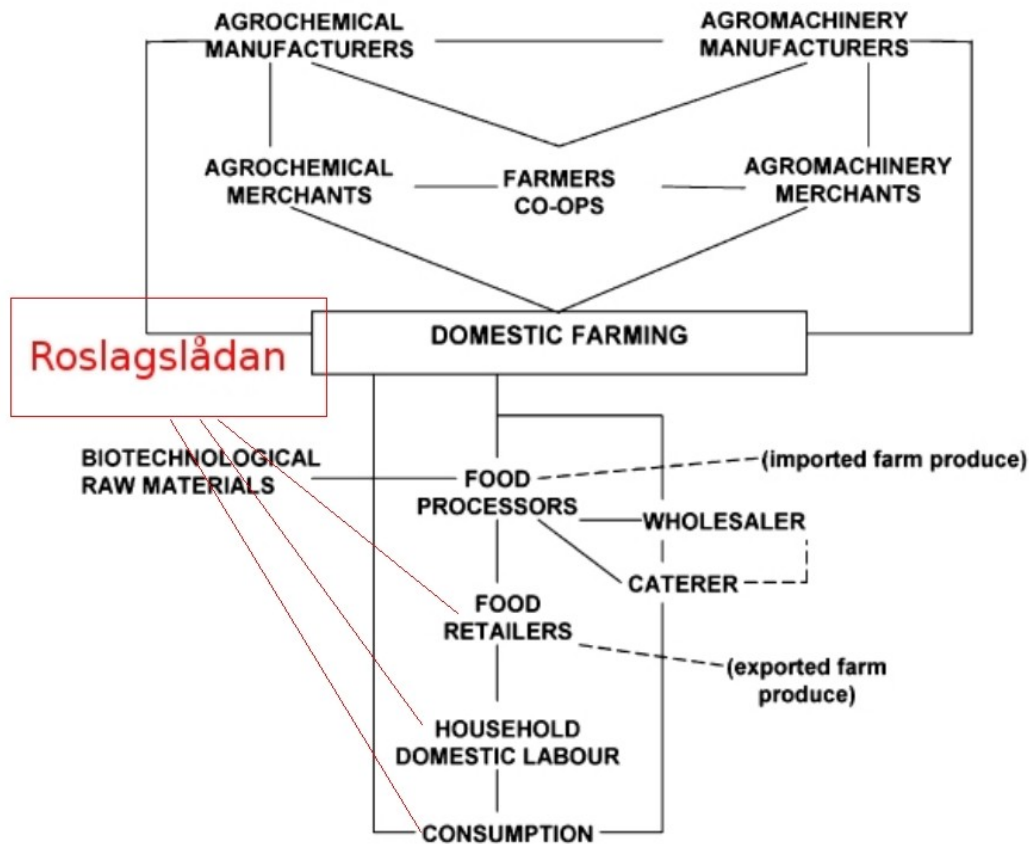


Figure 1: Structure of the 'conventional' agro-industry including approximate positioning of Roslagslådan. Adapted from Dantsis et al (2009).

As Figure 1 shows, Roslagslådan impacts upon - and is impacted upon by - much wider economic, social and environmental communities. Untangling this complex web is a task too great for the scope and resources of this project, therefore research will be limited to phenomena only at the firm-level.

There are numerous models and theories relating to sustainable rural development and the concept of Sustainable Development, by its nature, is interdisciplinary. Therefore, parameters by which the social, economic and environmental effects can be considered must be tightly defined. The concept of Sustainable Development will be defined as in the Brundtland report: meeting the needs of present generations without jeopardizing the ability of future generations to meet their own needs (Brundtland, 1987). Rural Development Policy will refer to the European Commission's *Rural Development Policy 2007-2013* to which Sweden, as a member of the EU, adheres (European Commission for Agriculture and Rural Development, 2009). Alternative Food Supply (AFS) will be used as the umbrella term for all systems of food supply that consider themselves as alternative options to the 'conventional' food supply system.

Evaluating the economic, social and environmental impacts of Roslagslådan will be based on parameters collated from the literature review. There are as yet no universal standards for evaluating sustainable food supply systems, rural development or agriculture in general (Andreoli & Tellarini, 2000; Ilbery et al, 2005). Parameters by which this paper evaluates Roslagslådan will be detailed in the literature review, described in the empirical findings and discussed in the analysis and conclusion sections.

This project will not be using technical methods to assess environmental impacts of Roslagslådan, such as measuring soil contamination, energy use or emission calculations. This is beyond the scope of the paper. Environmental and ecological concerns relevant to the project will be raised and discussed, making recommendations for further research and with reference to the research currently being undertaken by SLU Energi och Teknik department.

The terms food security and food safety have many definitions. In less 'developed' areas of the world it signals access to a daily diet nutritious enough for survival, while in the more 'developed' world it is more a demand for food with qualities such as traceability, known production methods and hygiene standards (FAO, 2009). As this project focuses on Sweden, a more 'developed' nation, food safety and food security refers to the demand for traceability, known production methods and hygiene standards demanded by the consumer.

The concept of local is highly contested. For the sake of this project, whenever the term 'local' is used with reference to the Roslagslådan case, it will refer to food produced only within Roslagen, a region on the East coast of Sweden, just North of Stockholm. This will be expanded in more detail in the empirical findings.

2. Method

The concept of Sustainable Development, particularly with regard to food systems, is contextually driven, with significant economic and social implications. The academic field of Sustainable Development is relatively new and undeveloped. The area of alternative farming and food networks is also young, with a range of new theories proposing shifts away from assumptions commonly held by more traditional economic and social theories. Because of these factors, the best study approach is a thorough, exploratory case study of one example of an AFS network - Roslagslådan – to contribute knowledge to the growing field and explore how (and if) relevant theories apply in a real world context.

After reviewing relevant literature and selecting the theoretical framework, the case study method is used to gain an understanding of the Roslagslådan food network as a discrete situation within the larger phenomenon of AFS theory. A single case study is used because this paper does not aim to engage in the comparison of clearly defined situations, but to create a deep and thorough understanding of a complicated phenomenon within a relatively new research field.

The research is purely qualitative, comprising a series of in-depth, open-ended interviews of suppliers and customers (Yin, 2009). These interviews were conducted face-to-face, via telephone, and via email, lasting on average between one and two hours (or the equivalent via email). In preparation for each interview, an outline of questions and topics to be answered was drafted and followed loosely in order for the interview to remain on track but enabling the interviewee to be as open as possible in answering the questions. All face-to-face interviews were recorded, then transcribed and returned to the interviewee with the opportunity for clarification.

Secondary sources such as theoretical and empirical studies were consulted and analysed in the literature review. Qualitative research methods are used primarily to understand this complex situation in depth, from multiple points of view, and in context (Neill, 2006).

Triangulation (Yin, 2009) is implemented both at the information gathering and research methodology levels. The literature search was limited to credible organisational reports (for example United Nations and European Commission for Agriculture and Rural Development) and peer-reviewed academic journal articles. The literature review was then complemented by conducting open-ended interviews with all three Roslagslådan suppliers and two of their customers to gain a clear understanding of the situation from multiple viewpoints. Observational research was also conducted on two of the three delivery routes, as well as discussions and collaborations with experts conducting another study on the same case¹.

¹ Research group from the Energi och Teknik department at Sveriges Lantbruksuniversitet, Ultuna is currently conducting a study on optimising the transport & logistic systems of Roslagslådan.

The case study method has often been a recommended research tool at the early stages of research development when theory is yet to be established (Yin, 2009). As case studies are largely qualitative, they often receive much criticism as to their rigour and credibility. Gibbert et al (2008) outline four criteria essential for a rigorous case study: internal validity, construct validity, external validity and reliability.

Internal validity is when a researcher succeeds in creating a “plausible causal argument, logical reasoning that is powerful and compelling enough to defend the research conclusions” (Gibbert et al, 2008: 29). In order to achieve internal validity, this paper implements triangulation as discussed above in order to clarify findings and acknowledge different perspectives.

Construct validity refers to the extent to which the questions asked at the data collection stage contribute to an accurate observation of reality (Gibbert et al, 2008). In the attempt to minimise problems with construct validity, research parameters are based solely on previously published literature (as outlined in the literature review section) and the interviewer attempted to be critical and aware of personal subjectivities when conducting interviews.

External validity can be defined as to the extent to which outcomes from the case study can be generalised into theory to explain other similar cases. Gibbert et al (2008) argue that if a paper achieves internal and construct validity, it logically follows that external validity will be apparent. While this paper does not aim to propose general theory based on empirical findings, it is hoped that the data gathered and discussed will contribute to the pool of knowledge that will eventually develop more grounded theory for this field of research. This will be discussed in more depth in the concluding remarks.

Finally, Gibbert et al (2008) define case study reliability as the possibility for another researcher to repeat the same case study and arrive at the same results. By creating a 'case database' that contains recordings and written transcripts of all data encounters, case study reliability can be improved. A 'case database' of Roslagslådan has been maintained throughout the data collection stage to ensure a clear timeline and report supporting the writings in this paper for repeatability.

3. Literature review

3.1 Sustainable Development

The concept of Sustainable Development (SD) has strong support and much public and political attention, but as an academic field it is relatively new and underdeveloped. Simply, it recognises that economic development, social development and environmental preservation are interdependent, and all three must be managed in a balance in order to preserve natural resources and human well-being at a level that can be sustained indefinitely (United Nations, 2005). The concept deals with aims to move the current popular world view away from a focus on neo-liberal capitalist measurements of growth and productivity as a sign of development, towards a type of development that considers social aspects and levels of environmental resilience in an attempt to sustain humanity on Earth indefinitely. In addition to the relationship between humans and their environment, SD aims to remedy problems of poverty, health and inequality among humans.

Although the SD concept has been around for more than two decades and is often the focus of political agenda, its definition (and means for achievement) is contentious and constantly argued. It has been adopted as the catch-cry for nature conservationists and economic rationalists alike, manipulating the term to fit with their own values. This ambiguousness has been blamed as the cause of so few measurable improvements on environmental and social situations due to the inability to move beyond political debate to policy action (Sneddon et al, 2006, and Sachs, 1999). Against such a confusing backdrop of varied meanings, the definition outlined by The Brundtland Report, *Our Common Future*, is the most widely agreed upon, conceiving Sustainable Development as a dynamic “process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are made consistent with future as well as present needs” (1987: 9). In other words, protecting and sustaining Earth's goods for future generations. In order to sustain human existence, the environment must be managed sustainably and viewed in context with socio-economic aspects. Unfortunately, a checklist of how to achieve this remains missing.

Rist (2002), proposes that the motive for SD is contradictory and unsubstantiated, arguing that the term has been conceived to skirt the problem - not solve it – and that supporters often cite continued economic growth as the cure when it is just as likely that that caused the initial concerns. The term's ambiguity is convenient as it can be interpreted as both an attempt to sustain the environment, or, development as we currently know it. Rist notes that the Brundtland report-writers “oscillated between reminders of the environmental limits on 'development' and exhortations to advance boldly into a 'new era of economic growth’” (2002: 193) thus keeping all parties happy and praying for production efficiencies and new technology to one day save us all.

Further, the concept of Sustainable Development calls for many historically disconnected and specialised faculties to collaborate in order to create a new developmental discourse; natural scientists must work with economists and sociologists to arrive at solutions that are not compromises but three-way-win situations that work now and in the foreseeable future. The SD concept attempts to merge economic aims with social and environmental well-being. At its most potent, the concept aims to shift the dominant Western worldview of liberal capitalism towards one where economic growth and increased monetary wealth are not the only measures of human development and welfare (Sneddon et al, 2006) and environmental and social externalities such as air and water pollution, labour abuse and land degradation are not suffered by an innocent third party but included in the economic considerations of the potential offender (Pearce, 1990). This aim challenges social and cultural norms world wide, and, as it calls for global effort, challenges ideas on national identity and the structure of international politics.

Fuelling the debate over its meaning, discussion of SD tends to use vague language, and theory rarely leads to measurable success (Morse, 2008), therefore more academic research must be focused upon pragmatic ways to achieve the aims posed by the concept of SD. This, however, may not be a problem of the concept itself, but the problem that many perceive SD as a desirable state to be reached as opposed to a process or tool that should be used to frame analysis and discussion when developing strategies for sustainability (Maxey, 2006) – in whichever field it is relevant.

3.2 Sustainable development and food supply

Recently the fields of food supply, agriculture and forestry have grown strong links with the SD concept due to their close connections with natural environments and natural resource management. This has strong implications for development strategies for rural areas, where most of such activity takes place. In the European Union (EU) 91% of the land area is classed as rural, with almost 60% of the EU population living in rural areas (European Commission, 2007). It is from rural areas that the Earth's human population derives its food and therefore sustaining healthy rural areas is an imperative for human survival. Recent consumer concerns for food security in terms of accessibility, health and environmental concerns has further compelled consideration of rural development (Enshayan, 2004; Oki & Sasaki, 2000; Winter, 2003). Therefore, the way in which rural areas develop is of significant interest to industry, society and the environment. The European Commission's rural development policy for 2007 to 2013 focuses on three key aims: one, improving the competitiveness of the agricultural and forestry sector; two, improving the environment and the countryside; and three, improving the quality of life in rural areas and encouraging diversification of the rural economy (European Commission, 2009). These themes reflect the SD concept, paying attention each to economic, environmental and social factors.

During the 1950s, EU rural policy focused predominantly on reductionist methods such as streamlining productivity to increase output as a means of recovery from the debilitating World Wars. From this policy, the large-scale, global agro-industry grew,

relying on high-volume production and cheap international transport to capture economies of scale and provide cheap food to the developing nations (Dantsis, 2009; Winter, 2003). Low world food prices and high production scales marginalised many small-scale rural farmers leading to economic inequality within the agricultural sector (European Commission, 2009). Since the 1990s, as this was being realised and the Sustainable Development concept began to receive significant political attention, the EU's Common Agricultural Policy (CAP) also began to consider social and environmental aspects in addition to the purely rational economic (European Commission, CAP Explained, 2009). The CAP has since amended its policy to add a section, which deals specifically with the rural agricultural sector (Watts et al, 2005). It includes several, specific guidelines for rural development, proposing to: ensure a stable and affordable supply of food for its population; provide a reasonable standard of living for EU farmers, while allowing the agriculture sector to modernise and develop enabling farming to continue in all regions of the EU; improve the quality of Europe's food guaranteeing food safety; looking after the well-being of rural society; ensuring that the environment is protected for future generations; and providing better animal health and welfare conditions. This is proposed to be done at a minimal cost to tax payers (European Commission, 2009). Once again, environmental, social and economic factors are all addressed.

As the climate change debate escalates, rural areas are becoming even more precious as they are considered 'carbon sinks', sources of renewable energy and secure and vital food production areas (Kitchen & Marsden et al, 2009). However, as farming is consistently less lucrative than other income sectors throughout the EU², strong emphasis has recently been placed on diversifying farm activities and promoting innovative activities to improve farm economic performance and also affect rural quality of life (van der Ploeg et al, 2000). Farmers are also being understood as 'custodians of the countryside' and it is proposed that in addition to providing nutrition for society, farmers dedicate their business also to protecting rural natural resources (Pacini et al, 2004). Farming is often a family business and the seasonal nature of the work means that small-scale agriculture is more than a job, but a lifestyle (European Commission, 2009). Farmers are now understood to have many responsibilities and play many roles in rural society. Such 'pluriactivity'³, 'ecological entrepreneurship' and 'alternative food supply systems' are all heralded in the academic and political realm as strategies for farmers and rural workers to stay economically competitive in an industry dominated by global-scale, conventional farming systems. Such AFS methods are also proposed to bring about social and environmental benefits (Marsden et al, 2005; Renting et al, 2003; van der Ploeg et al, 2000).

2 Between 2000 and 2006, the average monthly per capita income in agriculture was €700-€900 versus the average monthly per capita income in other sectors of €1300-€1600 (European Commission, CAP Explained, 2009).

3 Described by Marsden (2005) as farms generating income in a variety of forms in addition to food production. For example agro-tourism, artisan production, off-farm labour, or quality and safety training and auditing.

3.3 Alternative Food Supply

AFS theory has spawned from this shifting of rural development theory and policy closer towards concepts of sustainability mainly due to public concerns over food security and economic survival of small regional areas in the wake of global-scale, 'conventional' food supply. Ideas such as the eco-economy and ecological modernisation (Curtis, 2003; Kitchen & Marsden, 2009; van der Ploeg, 2000; Marsden, 2004; Danson, 1998) have thus been formed. Eco-economics is an attempt to 're-embed' social and environmental factors into neo-classical economic foundations so that unlimited economic growth is not assumed, profitability is not the only goal, and production costs more closely reflect the value of all inputs. This theory is not specific to rural development but in line with general environmental economic theory where "economic sustainability is most commonly interpreted as a condition of non-declining economic welfare projected indefinitely into the future" (Danson, 1998: 865). This economic welfare considers natural and social capital in addition to the neo-classical list of physical, investment and human capital to ensure that all externalities such as pollution and wage rates are considered, along with the more realistically valued opportunity costs of exploiting natural resources, when assessing this 'non-decline' (Pearce, 1990). It is a rejection of economies of scale and utility maximisation to focus on a more complex assessment of 'quality of life'; it places further importance on social needs over individual willingness to pay (Curtis, 2003). Such ecological economic theory has been adopted in many businesses as the 'triple-bottom line' (Fields, 2002), meaning that the traditional bottom-line of profit maximisation is no longer sustainable for modern businesses. Organisations must consider their production and operations within a system involving society and the natural environment in order to remain sustainable in the long run, therefore the single bottom-line has become three-fold as businesses become aware of their impact upon social well-being and natural resource conservation (Fiksel, 2001).

The idea of Ecological Modernisation plants eco-economics within rural development theory by purporting that rural areas do not provide solely economic value in maximising food production volume, but the landscape has intrinsic social and environmental value; the 'rural lifestyle' has value, it has tourism and recreational value and acts as a pollution filter for denser urban areas (European Commission, 2009; Kitchen & Marsden, 2009). Marsden (2004) declares Ecological Modernisation as the next phase in rural development, taking over from the modernisation period during the 1950s to 1990s where costs were kept at minimum by increasing production volumes to compete in an increasingly globalised industry. Ecological Modernisation is the proposed solution to the continued marginalisation of rural areas because of relatively low farm incomes, susceptibility to volatile food markets and the generally unpopular farming or rural lifestyle (Kitchen & Marsden, 2009; CAP, 2009). Supporters of Ecological Modernisation propose rural survival rests upon a re-focus towards the regional and local area, shifting away from traditional rural activities of solely food production towards a more multi-functional development where environmentally friendly agriculture exists in

parallel with tourism and diversified small-enterprise (van der Ploeg, 2000; Kitchen & Marsden, 2009; Marsden, 2004).

AFS is one method by which Ecological Modernisation is asserted to be reached, particularly with respect to rural areas. In the concept's early stages, European literature and North American literature have held parallel expectations for AFS theory. North American literature (for example Allen, 2003; Bellows & Hamm et al, 2000; Hinrichs, 2000) perceived AFS as a political movement against conventional, globalised agriculture towards increased local autonomy, whereas European theory (for example Marsden & Smith, 2005; van der Ploeg, 2000; Renting et al, 2003) saw AFS as a leg-up for rural development (DuPuis & Goodman, 2005; Holloway et al, 2006). This rift remains today although there is increasing mutual awareness sparking comparative studies between Europe and North America (For example Ilbery et al, 2005; Maxey, 2006). AFS is a broad term to include the range of different food supply networks, innovations and systems between farmers, consumers and other rural development actors that follow an alternative path to that of large-scale conventional agriculture (Renting et al, 2003). Such forms of AFS comprise practices such as agro-tourism, organic farming, artisan production, farm 'pluriactivity' and food provenance, as well as Short Food Supply Chains (SFSC) such as farmers' markets or delivery box schemes where the number of nodes in the supply chain is reduced to bring producers and consumers closer together and allow producers to capture a larger proportion of the value chain (Renting et al, 2003; Marsden & Smith, 2005). Definitions of these AFS have unclear boundaries and a wide range of motives and values, with many tactics overlapping or forming emergent systems amongst themselves. However, the three constant, key aspects identifying AFS are that they claim a local or regional focus, they aim for produce quality as an added-value, and they are motivated by social justice (Shoenhart et al, 2008; Renting et al, 2003; Marsden & Smith, 2005; La Trobe & Acott, 2000, Ilbery & Maye, 2005; Goodman, 2003). These three key factors are purported to offer their own benefits but are not mutually exclusive and tend to perpetuate each other.

AFS as local systems are supported by many different actors as beneficial because they are expected to enable the region to become self-sufficient both economically by keeping labour demand and income in the proximate area, and politically by creating local identities and social cohesion in line with the system's boundaries, promoting greater political (and possibly economic) influence (Marsden, 2004; Curtis, 2003; Enshayan, 2004; Schönhart et al, 2008). In addition, La Trobe et al (2000) and Curtis (2003) see local food systems as an environmental remedy to the problem of 'food miles' and excessive transport faced by global, conventional food supply as local food is assumed to require less distribution, processing and packaging. Also, food having a 'place', an 'origin', a 'provenance' implies a level of differentiation and an opportunity to capture added-value via the 'symbiotic capital' such local branding can create (Curtis, 2003; Marsden & Smith, 2005). Marsden & Smith (2005) expand this point by noting that once a 'place' identity has been marketed for a regional area, this creates additional possibilities

for networks of producers to use this brand collaboratively, evolving into stronger food systems in competition with conventional systems.

Critics raise three main points in arguing that the idea of 'localisation' is problematic. First, 'local' production and community networking do not automatically lead to local autonomy and democracy. Even in a closely tied producer-consumer relationship, conflicts arise when merchants are faced with decisions to improve economic prosperity, or the common good (Alkon, 2008). As a market expands, there is temptation to expand business. The success of organic agriculture in Europe has led many organic farms to 'conventionalize' processes closer in line with large-scale agri-business (Dantsis et al, 2009; Watts et al, 2005). Darnhofer (2005) agrees, noting a continual absorption of the organic food market into mainstream food supply networks, reducing the ability for small-scale organic farmers to receive premium prices for organic produce. Between seventy and eighty per cent of organic produce in Sweden is traded by corporate retailers operating within the conventional system (Renting et al, 2003). Locally-based food systems are forced to consider the level of expansion at which 'local' social and environmental benefits must be compromised for economic advancement.

One relevant study by Nouisainen et al (2008) evaluated the effect of local organic food supply on social sustainability. Findings were that close, intimate relationships between producers and consumers within the network were perceived to create solidarity, encouraging place identity and trust, as well as knowledge, resource and skill sharing amongst producers. However, there were divided opinions as to how much this solidarity translated into influencing the larger food system as well as the impact on economic benefits and food pricing.

Second, defining what is 'local' is problematic. Any food system does not operate in a vacuum (Bellows & Hamm, 2000; Dantsis et al, 2009). Population densities, climate, and varying resource qualities make it difficult for contemporary local food systems to be entirely self-sufficient. This is particularly problematic in competing with global systems providing all types of produce all year round, which is often what is demanded. Typically, a local food system operates in parallel or integration with larger, more 'conventional' operations (Selfa & Qazi, 2005). Currently, AFS tends always to be referred in juxtaposition with conventional food supply systems and therefore it is questionable as to whether purely local food systems have the supply capacity to become the dominant system – or if this is desirable at all (Bellows & Hamm, 2000; Schönhart et al, 2008). The larger question is at what point on the local versus global food supply spectrum is it most sustainable for a system to operate.

The concept of 'local' as defined by the consumer perception of being in the same geographical area of production is also problematic in that not all food systems

considered local are geographically proximate (Goodman, 2004; Selfa & Qazi, 2004). Foods can also be produced in a region that is perceived to have some unique value in terms of quality, heritage or production processes, they may not necessarily be consumed locally, but marketed to consumers in far flung places as 'local' to the particular value recognised as coming from a particular region. Additionally, 'local' can also refer to producer and consumer proximity not through space, but through supply nodes, for example, direct online sales (Renting et al, 2003), where consumers and producers can be in close contact without being geographically proximate. The fact that 'local' can mean many things has significant implications for generalising on the effects 'local' food systems have on factors such as economic and environmental distribution costs, as well as social embeddedness.

Third, as regionally produced foods may be able to differentiate themselves from the more standardised, global 'supermarket' products via marketing landscape, cultural, historical or artisan production qualities of the region, there can be significant difficulty for local regions to differentiate between themselves (Ilbery & Kneafsey, 1998). In addition, such small scale networks may not have the influential power or communication channels to convey this to potential consumers (Ilbery & Kneafsey, 1998).

AFS supporters proclaim the concept focuses on current consumer demands for quality production at the expense of the goal to achieve economies of scale - ensuring customer satisfaction and enabling producers to command a premium price if communicated effectively (Ilbery & Kneafsey, 1998). Goodman (2003) and Ilbery & Kneafsey (1998) both agree that the 'quality' claim for AFS is extremely broad, encompassing any aspect from the product's composition, its mode of production to its connotations. Such claims hold an unbalanced focus on the production-side, ignoring how such 'quality' aspects will be perceived and valued by consumers – let alone be communicated. Furthermore, using labelling to communicate 'quality' can lead to label fatigue, confusing consumers and losing the expected 'quality' added-value (Goodman, 2004).

Quality may also refer to protecting the environment and the local landscape (Smit & Brklacich, 1989) as farmers take on multi-roles of food producers and stewards of the natural and cultural heritage of the area (Pacini et al, 2003; European Commission, 2009). By using AFS to capture more nodes in the supply chain while commanding higher prices for 'provenance' or 'organic' foods, supporters profess producers are encouraged to take care of the surrounding natural resources via the more environmentally sound methods that are demanded by such production methods (Marsden & Smith, 2005).

Partly due to such proclaimed local aspects and the quest for quality, AFS theorists argue the systems promote social embeddedness, meaning the support of local employment, strengthening cultural heritage, local identity and awareness, and the economic potential

of the community, as well as fostering fertile market infrastructure to sustain economic transactions by developing trust-based relationships (Ilbery & Kneafsey, 1998). The notion of farmers as carers for the landscape is also inherent in this socially embedded, ethical approach to farming and production (DuPuis & Goodman, 2003). These points are also contested by critics for several reasons, explained below.

The manifestation of AFS in small communities often is at the hands of a strongly-opinioned, often white, often middle-class elite who are not necessarily representative of the whole community (Hinrichs, 2003; Goodman, 2003). Furthermore, organically produced foodstuffs are often more expensive than their 'conventional', 'no-frills' supermarket counterparts and are therefore often only available to certain socio-economic sectors. While those participating in localised, small-scale food networks may feel embedded socially in the organisation, those without the means or social status to participate may feel such networks are significantly exclusive – possibly even more so in some ways than conventional food systems.

DuPuis & Goodman (2005) bring up notions of 'reflexism', warning against the dangers of placing AFS in direct contrast to 'conventional' food supply systems with the claim that they are inherently socially embedded. Local food systems – like conventional ones – must be open, self-aware and self-critical (that is, reflexive) to achieve such social inclusion and improved local trust relationships. He adds that local food systems should not be put forth as “resistance against a capital 'logic' but as a mutually constitutive, imperfect, political process in which the local and the global make each other on an everyday basis” (2005: 369).

Alkon (2008), in her case study of two farmers' markets in San Francisco, investigates ideas of social justice and the trade-off between economic rationalism and social welfare, finding that while social and environmental justice are key values for producers at these farmers' markets, the aims are compromised in line with their individual economic goals:

“While market managers and customers promote and support local organic producers in the interest of justice and sustainability, vendors must prioritize their own economic needs. To a certain degree, because organic products carry a premium price, ecological goals are consistent with economic ones. Social justice priorities, on the other hand, such as providing food to those without access and offering benefits to farmworkers are necessarily at odds with increased profits” (2008:479).

Ilbery & Maye (2005) expand on Alkon's point by noting that all economic relationships involve a varying degree of social embeddedness whether alternative of conventional and “while local food economies may be fuelled by interpersonal ties, trust and reciprocity, they will carry undercurrents determined by relations of power, inequality, conflict and

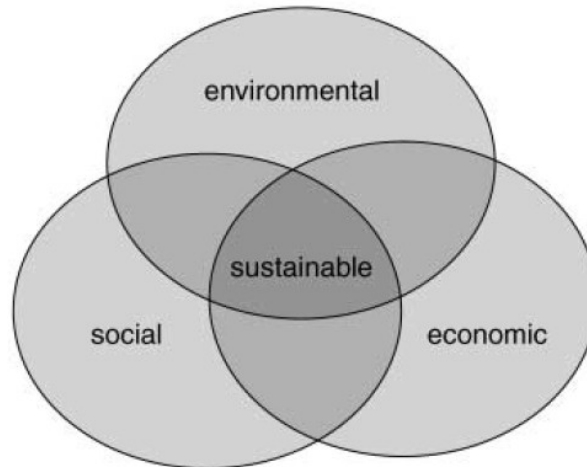
personal gain” (2005: 335). AFS are not immune from power struggles and conflicts between what's best for the individual as opposed to what's best for the community.

Despite such wide academic discussion and debate surrounding the area of AFS, empirical research is still relatively limited and is sparsely spread over a broad area of specialised topics, meaning concentrated data in any one area is lacking. From the literature reviewed, empirical research was fairly evenly distributed between Europe and North America, with a significant focus at the community level (as opposed to the firm or global level), and on the social aspects of sustainability (Alkon, 2008; Darnhofer, 2005; Hinrichs, 2003; Holloway et al, 2006; Nousainen et al, 2009). Resulting from this literature review, there was found only one previous case study addressing the sustainability of an AFS at the firm-level. This comparative case study by Maxey (2006) assesses several small-scale food networks in Canada and UK based on the Actor Network Theory. The focus is on understanding the discourse creating and being created by all actors within the network, concluding that while the networks themselves could be considered highly sustainable, the economic, social and political contexts in which they operate makes them fragile.

The next section will discuss the parameters used in this project to assess each factor of sustainability: economic, social and environmental, with the criteria being collaborated from a range of literature sources selected as a result of the literature review.

4. Sustainability parameters

The concept of Sustainable Development centres on a balance between the three key pillars of sustainability: economic, social and environmental. Figure 2 models simply the interactions between the pillars of sustainability in realising the SD concept.



*Figure 2: Three interdependent pillars of Sustainable Development
source: Maxey (2006)*

According to Figure 2, sustainability is strongest when all three pillars overlap, with equal weighting in each field. The model represents that as any one of the three pillars holds less weight, potential for sustainability becomes weaker. While this paper focuses on assessing the economic sustainability of the Roslagslådan firm, it is important that social and environmental issues are raised in order to maintain recognition of the holistic SD concept. Figure 2 is a clear and telling image of the aims of SD, however it fails to specify the points at which trade-offs between the three pillars take place, or how to measure optimal balance.

There is no clear and exhaustive list of parameters by which to assess the economic, social and environmental sustainability of AFS, or in particular SFSC. Based on the literature available, a list of parameters have been formed for each factor of sustainability. In the literature, criteria for sustainable food systems tend to be listed altogether, but for the benefit of giving each factor of sustainability (economic, social, environmental) its due consideration, the criteria are divided into their relevant sustainability category below. There is considerable overlapping of criteria amongst the three areas but a systematic approach such as this will hopefully arrive at the most thorough and balanced conclusion.

4.1 Economic sustainability parameters

Of the current literature attempting to list criteria for sustainable food supply (Ilbery & Maye, 2005; Holloway et al, 2006; Kloppenburg et al, 2000; Nousainen et al, 2009), the

main focus is on outlining social and environmental sustainability factors. Although the literature does mention the need for food supply systems to be economically sustainable, detailing what is meant by this is focused on less-so than for social and environmental criteria, with the exception of Kloppenburg et al's article (2000), highlighting the need for food supply businesses to be profitable and able to offer workers a living wage rate that is competitive with off-farm labour – promoting farming as a reasonable consideration for a career, as opposed to its usually being an inherited or family business. I do not see this as an oversight of the field literature, but rather an understanding that at the firm-level, there is already much literature on sustainable business strategy from business, management and organisational academic fields that can be adopted for assessing AFS economic sustainability. Therefore, the following criteria for economic sustainability of an AFS, SFSC in particular, has been collated from theory on sustainable competitive advantage, sustainable business modelling, and network theory.

Michael E. Porter in his book, *Competitive Advantage*, (1985) considers the firm as a unit and the way in which it can create – and sustain – competitive advantage. He describes competitive advantage as the value a firm can provide for its customers compared to the competition, which translates into profit, that must be sustained in the long term is the firm wants to continue operating (1985). In achieving competitive advantage firms can choose to follow strategies of cost leadership, differentiation, focussing on a defined market segment, or chasing a mixture of these strategies. However, Porter notes that in order to sustain this competitive advantage, firms must create barriers making it difficult for competitors to muscle in on its market (1985). Barriers can include (but are not limited to) unique skills, knowledge or technology; first-mover advantages; consumer perceptions of value; or even the industry structure itself. If a firm can maintain such barriers (or consistently create new ones as old ones weaken), it will sustain its competitive advantage.

Much AFS literature claims that when food supply systems operate as networks, social benefits such as potential for mutual learning, reduced transaction costs, social cohesion and competitive strengths emerge (Nouisainen et al, 2009; Hughes, 2005; Holloway et al, 2006). Roslagslådan can be described as a business network (Halinen & Tornroos, 2005; Eng, 2005) and therefore it is possible that it could facilitate some or many of the social and economic benefits such AFS literature claims. It is viable, then, to assess how strong a network Roslagslådan is and if it provides such benefits to its members.

In a study of the costs and benefits for farmers involved in alternative marketing channels (for example farmers' markets or collective selling arrangements) compared to distribution via conventional channels, Verhaegen & van Huylenbroeck (2001) found that in all six channels studied, collective initiatives reduced overall operational costs versus benefits and the need for farmers to make excessive initial investments. Additionally, any higher transaction costs caused by developing the alternative marketing channel were offset by the ability of the farmer to capture a higher price for produce. Specifically, the transaction costs comprised costs of gathering the information and skills to commence the

project, negotiating terms with potential network partners, and controlling that the terms are honoured. Additional factors assessed were how the network affects revenue and direct costs, as well as levels of price and demand volume uncertainty (Verhaegen & van Huylenbroeck, 2001).

Murdoch (2000) highlights two forms of networks, vertical and horizontal, in the agro-food industry. Vertical networks are seen to be more prevalent in 'conventional' food systems and involve relationships between producers, suppliers, processors and consumers along what he calls the 'commodity chain', where local producers involved in vertical networks are incorporated into larger-scale global food systems. In this instance, the structure and workings of such networks are highly contingent on power relationships between actors at each level in the network. Horizontal networks are described as more regionally embedded, where participants from the same geographical or industrial vicinity combine forces to strengthen their capabilities. In horizontal networks, success depends upon flexibility, trust, reciprocity and diversity to self-defend against volatile economic and political climates that call for skills in adaptation and innovation. As this project focuses on Roslagslådan at the firm level, it will be analysed as an horizontal network.

Oerlemans & Assouline (2003) take the network argument further still in pointing out that it is not just the features and effects of a network that can determine the sustainability of its aim, but the sustainability of the network depends upon how the network is managed itself: “in collective strategies the focus should not only be on the goal of the group, but that attention to the process of cooperation such as safeguarding coherence, monitoring and evaluation of goals and views, shared responsibility and balanced leadership is a prerequisite for effective collective action” (2003:469). The authors note that in addition to external barriers for AFS such as competition, industrial standards or inadequate technical support, networks may experience internal barriers that hinder the effectiveness and ultimate sustainability of the network. This is most evident when a network may have a clear, coherent strategy and goal (for example providing affordable, quality, local food) however the management of the group and its learning process is neglected. The way a network is structured internally is an important factor determining operational success at the firm-level.

With reference to the discussion above, the economic sustainability parameters by which Roslagslådan will be assessed are as follows:

- has an identifiable competitive advantage and the potential to sustain this;
- exploits a network's supposed positive effect on production and transaction costs with reference to added revenue and investment benefits;
- and displays sustainable network relationships and management.

4.2 Social sustainability parameters

The social sustainability benefits credited to Alternative Food Supply largely focuses on 'localness'. Marsden (2004) argues that as the processes of an AFS remain in the

proximate geographical region, added-value remains within the local community, strengthening it and remedying socio-economic inequities. Such added-value refers to stimulating the local labour market and enabling the benefits of processing and production to remain within the community because local customers consume the goods, offering economic compensation to local producers. Nousainen et al (2009) in their research of AFS in Finland found that such systems increased labour intensiveness due to the extra marketing and distribution work involved for farmers, but rarely enable extra labour employment. Additionally, limiting markets to strict geographic regions was seen as a constraint in gaining income via market expansion.

Another key conflict in AFS (particularly local) literature is the notion of 'social reflexivity' (Hinrichs, 2003; Alkon, 2008; Dupuis & Goodman, 2005; Ilbery et al, 2005). Supporters claim that local markets provide a 'counter-hegemony' to restrictive global markets where small-scale local providers are forced to be price-takers (DuPuis & Goodman, 2005). This 'counter-hegemony' is supposed to manifest as closely connected actors within the local system gain economic and political strength as they unite to share embedded values and norms representative of the local community (Curtis, 2003; Bellows & Hamm, 2000). DuPuis & Goodman (2005), Hinrichs (2003) and Winter (2003) all agree that such systems are not formed as region-wide co-operatives, but often formed by 'elitist' - often idealistic - minority groups with narrow shared values who are interested in promoting their values in direct opposition while not recognising the thoughts of the majority. They call this 'unreflexive localism' and claim that its existence threatens undemocratic, unrepresentative decision-making within the locality as the systems support the interests of only a small group within the region.

Goodman (2003) highlights that in terms of the 'quality turn', local food systems provide trust, social connections and embeddedness enabling consumers to know where their food came from and exactly how it was produced, developing personal relationships with the producers themselves. Hinrichs (2000) and Alkon (2008) add that while such embeddedness promotes reciprocity and loyalty between producers and consumers within AFS promoting social sustainability, there exists also economic instrumentalism as producers and consumers also are interested in gaining value in market transactions with respect to their own perceptions of this. How socially sustainable an AFS is depends on respective levels of embeddedness compared to economic instrumentalism.

In an attempt to be comprehensive, both Ilbery & Maye (2005) and Kloppenburg et al (2000) have created lists of criteria for sustainable food systems. Ilbery & Maye (2005) formed their list from published academic literature, while Kloppenburg et al (2000) sought to develop criteria by interviewing producers and consumers participating in such food supply systems. From these two lists, Table 1 outlines following key criteria for socially sustainable food systems as agreed by academics and participants in AFS. While criteria are largely overlapping, some points were only raised by one of the groups, therefore a combination of both lists is most comprehensive and representative.

Table 1: Social sustainability criteria from academics and participants

Criterion	Ilbery & Maye (2005)	Kloppenborg et al (2000)
<i>Healthy: for a balanced diet and no contaminants</i>	X	X
<i>Fairly or co-operatively traded</i>	X	
<i>Non-exploiting of employees</i>	X	X
<i>Accessible: geographically and economically for consumers</i>	X	
<i>Encouraging knowledge, respect and understanding of food and food culture</i>	X	X
<i>Participatory: involvement more than just market transactions</i>		X
<i>Socially inclusive relationships: emphasizing responsibility, communication, and care for each other and the land</i>	X	X

With reference to the discussion above, the social sustainability parameters by which the case Roslagslådan will be discussed are as follows:

- capturing local added-value in terms of employment and income;
- social reflexiveness;
- levels of social embeddedness compared to economic instrumentalism;
- and how the system performs with respect to criteria set out in Table 2.

4.3 Environmental sustainability parameters

The three key areas in which the Roslagslådan food system has environmental impact is in its production, distribution and packaging activities.

Generally it is academically agreed that organic methods of food production are more environmentally sustainable. While conventional agriculture methods are relatively independent of natural systems and cycles, relying on external inputs to affect soil fertility, organic farming aims to manage natural eco-systems to maintain crop yields to their natural carrying capacities (Lotter, 2003; Michelsen, 2002). Therefore production is at a lower volume than conventional methods - and less lucrative if products are sold at the same price as conventional products (Lotter, 2003; Michelsen, 2002). Organic methods also abstain from using chemical fertilisers and pesticides that potentially harm future field fertility and human or animal health, sustaining fields at a level that maintains quality for future production (Darnhofer, 2005; European Commission, 2007; European Commission, 2009; Dantsis et al, 2009). Both Ilbery & Maye (2005) and Kloppenborg et

al (2000) include organic production methods in their criteria for sustainable food systems as such methods are seen as less exploitative and more regenerative than 'conventional' farming methods.

La Trobe & Acott (2000) argue that it is not enough to label a food system environmentally sustainable solely on its production methods as often organic foods are transported long distances around the world, clocking up emissions from transport that more than counter-balance the benefits realised through more sustainable production. La Trobe & Acott (2000) claim that such 'food miles' are possibly the most environmentally damaging aspects of food systems as global transport costs - including fuel prices - are kept artificially low. Coley et al (2009) note that while local food systems are often promoted as sustainable solutions to the 'food mile' problem, it is not the distance travelled, but rather the carbon emitted throughout the whole production, storage and distribution process. Results of their study claim that “if a customer drives a round-trip distance of more than 6.7 km in order to purchase their organic vegetables, their carbon emissions are likely to be greater than the emissions from the system of cold storage, packing, transport to a regional hub and final transport to customer’s doorstep used by large-scale vegetable box suppliers”(Coley et al, 2009:150).

The food industry claims the largest demand on packaging than any manufacturing industry (Henningsson et al, 2004). It is important for the health of the environment that packaging of all kinds (not only petroleum-based plastics) is minimised to that which is necessary, therefore preserving unneeded resources for more valuable uses. Oki and Sasaki (2000) point out that 'necessary' packaging of foods is a complicated dialogue that includes balancing the environmental impact of packaging with health and social issues revolving around storage, labelling and how the consumer uses the product being packaged. It is therefore imperative that while attempting to minimise environmental impacts of packaging, its social benefits are considered, arriving at an optimal amount of packaging achieving environmental and social (and economic) sustainability.

With reference to the discussion above, the environmental sustainability parameters by which Roslagslådan will be discussed are as follows:

- in what ways are the vegetables used in Roslagslådan deliveries produced in an environmentally sustainable way – organic or otherwise;
- whether Roslagslådan offers an environmentally sustainable option for consumers in terms of transport and storage emissions;
- and is the packaging used in Roslagslådan deliveries optimal with respect to the balance between environmental and social demands for packaging.

5. Empirical findings

Every second Thursday afternoon during the warmer summer months, Dan and his wife, Britt-Inger from *Senneby Trädgård* farm, pack their two cars with a hundred-odd boxes of their freshly picked organic vegetables and set off on deliveries to customers dotted around the town of Norrtälje on the Stockholm Archipelago. In Rimbo, a nearby town, Claudia, who runs a herb business named *Saxens Örtor*, waits in her usual spot at the local supermarket carpark for her customers to collect another twenty similar boxes packed with organic groceries. A little further north in Östhammar, Ulrika and her partner, Torolf who run *Forsbergs Gris & Grönt*, are halfway through their round, delivering another thirty vegetable boxes to the homes of local buyers. Dan, Britt-Inger, Claudia, Ulrika and Torolf are all member suppliers of Roslagslådan, a local vegetable box delivery network.

Roslagslådan has been operating since 2006, beginning as an offshoot of *Roslagsmat*, a group of local food producers, whose catch phrase is: “mat med identitet och kvalitet”, meaning in English: “food with identity and quality”. *Roslagsmat* members collaborate to organise *Skördemarknader*, an annual series of local farmers' markets held at a local park in Norrtälje during summer. Members of *Roslagsmat* are all food producers located in the Roslagen area of Sweden, depicted as the yellow area in Image 1, below.

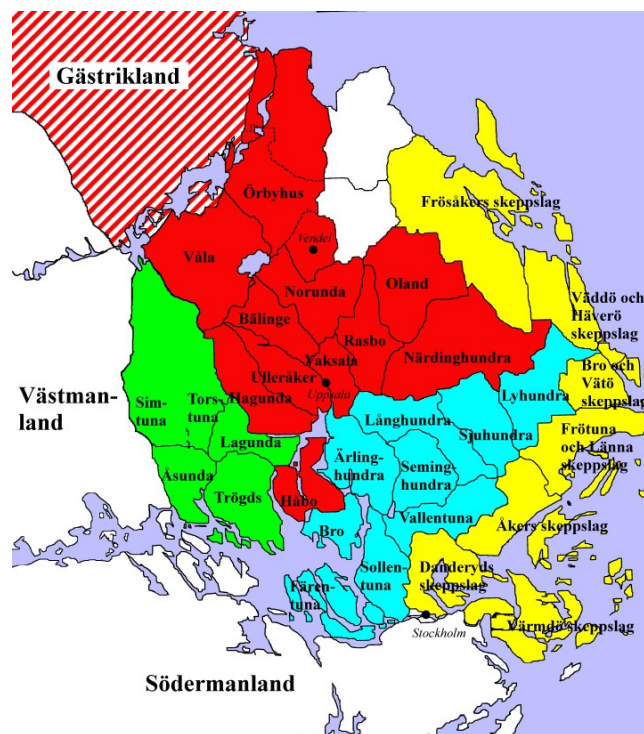


Image 1: Roslagen area (in yellow)

source: <http://en.wikipedia.org/wiki/Roslagen>, accessed 11.12.09

The *Roslagsmat* association promotes 'local food with identity and quality'. The *Skördemarknader* are very popular, but are held only three times a year during the summer. Dan, Claudia and Ulrika initiated Roslagslådan in order to supply their organic and local vegetable produce directly to customers for a longer period throughout the year, in the three areas around the Stockholm Archipelago. All three suppliers deliver fortnightly from August through October, with Ulrika and Claudia's deliveries extending until December. Claudia also delivers once a month in January and February.

Each delivery includes eight to ten different KRAV-certified⁴ varieties of vegetable, decided fortnightly by the supplier depending on the season and crops. A newsletter is included in the delivery outlining which varieties are in the box, information about the vegetables and recipes for the more 'unusual' and 'feature' vegetables. The newsletter also includes contact details, any relevant news or communication and additional produce such as bread or marmalade available for customers to purchase through Roslagslådan from other members of *Roslagsmat*.

Customers order and pay for the boxes online, in advance, and have the option to pay for the whole season at once, per month, or per delivery. The boxes cost 240SEK each plus a one-time deposit of 100SEK for the reusable, locally made wooden delivery box (which is returned empty the following fortnight on collection of each new vegetable box). At the end of the season, customers can choose to receive back the 100SEK deposit or receive additional vegetables on return of the final, empty wooden box.

In 2005, having received a European Union grant from Länsstyrelsen (Swedish rural administrative board), Claudia was able to work full-time for one year to initiate Roslagslådan. The grant's criteria demanded that the project was cooperative - including many farmers or businesses. The project had to be new and not attempted before. After visiting other existing delivery schemes in Southern Sweden, Denmark and the UK, the three farmers developed an outline of what they wanted Roslagslådan to be:

“I spent 12 months setting up Roslagslådan. Ulrika, Dan and I sat down and discussed what is good with Årstiderna and Mossagården [other, larger delivery schemes] and decided how we should do it. The conclusion was nothing imported - no bananas from Chile. We wanted to have just our own vegetables and we don't want to run it the whole year. People must learn that a season is a season.”

Claudia, October 2009

After garnering a pilot group of customers via a local newspaper advertisement, the three partners began planning logistical routes based on where their clients lived. After a period of trial and error, Roslagslådan became a fully fledged delivery scheme in 2006 operating

⁴ KRAV is the Swedish labelling certification that a product has been organically produced. It does not guarantee quality (KRAV.se, 2009).

in three areas around the Stockholm Archipelago. Over the following four years, the operation has developed a steady customer base, totalling approximately 150 regular customers.

5.1 Senneby Trädgård

Senneby Trädgård grows a wide variety of KRAV-certified vegetables in three different fields and one greenhouse. The farm focuses on salad vegetables such as tomatoes, cucumber, lettuce, capsicum, carrot and snow peas but potatoes, celeriac, squash, leek, parsnips and others are also grown. Crops are usually varied from year to year for experimentation and based on the weather.

In addition to Roslagslådan, Senneby Trädgård holds a stall at the annual *Skördemarknader* and operates an on-farm vegetable store between July and September, but customers can ring at any time throughout the year to make personal orders. Between May and December, the farm also runs a special stall in the vegetable department of the nearby ICA supermarket. The stall is stocked and maintained by Senneby Trädgård but customers purchase the produce via the check-out. The farm also rears a small number of sheep, which are slaughtered and sold locally during the winter.

5.2 Forsbergs Gris & Grönt

Forsbergs Gris & Grönt is also KRAV-certified and operates on 20 hectares of land. With a greater focus on root vegetables the farm is able to extend Roslagslådan deliveries further in the winter. As well as the various root vegetables, Forsbergs Gris & Grönt grows around 20 varieties of potato and a selection of warmer weather produce such as lettuce varieties.

In addition to Roslagslådan, Forsbergs Gris & Grönt supply several ecological stores, supermarkets and restaurants in the wider Stockholm area. Their supply is mainly on a large-scale basis, with pre-order agreement. The farm also rears a number of sheep, which are slaughtered and used for wool locally.

5.3 Saxens Örter

Saxens Örter produces herb-based products such as vinegars, oils, skin products and teas using local, KRAV-certified herbs. Saxens Örter does not produce any of its own vegetables, so Roslagslådan produce is sourced from Forsbergs Gris & Grönt at an agreed price and this is made known to customers in the fortnightly newsletter. Claudia, who manages Saxens Örter, writes the newsletter for both her and Forsbergs Gris & Grönt's Roslagslådan deliveries. She receives additional vegetables in return for this service.

6. Analysis

6.1 The economic

Roslagslådan's image centres largely on the values of the service: fresh, local, quality, organic vegetables delivered personally to the customer by the farmer who grew them. Roslagslådan is a marketing and distribution tool aimed at facilitating an extended market for the participating farms – both in time and space:

“It spreads our products in a wider region and at the same time it makes more people come to our farm shop and people buying at the farm shop hear about Roslagslådan – it is a self-feeding system that sits well together.”

Dan, September 2009

“Our farm shop ends in September but we continue to deliver [Roslagslådan] until the end of October. This means we can experiment a bit with more winter, root vegetables like celeriac”

Britt-Inger, October 2009

Roslagslådan is an extension of each farm's already established business activities and values.

6.1.1 Sustainable competitive advantage

Porter (1985) notes that in order to identify a business' competitive advantage, its value chain must be identified and modelled. A firm's value chain is each discrete activity completed in the firm's operations that either leads to cost leadership or a type of differentiation from its competition, which can then be analysed to realise the firm's competitive advantage. Figure 3 shows Porter's (1985) value chain model adapted for Roslagslådan. For each business unit on the horizontal axis, with respect to both support activities (technology, human resources and procurement) and primary activities (activities specific for delivering the business promise) on the vertical axis, all activities involved in Roslagslådan operations were plotted to distinguish the business' competitive strategy.

Firm Infrastructure – value chain					
Technology		Online ordering and payment			
Human Resources		Loyal, skilled & invested personnel			Growers are the managers
Procurement	Local, organic, picked-the-same-day vegetables Zero stock-on-hand; wastage				
Primary activities		High quality control Extremely fresh produce, different to what's available in local supermarkets	Drivers are familiar with all routes and customers	Timely & reliable delivery Order contents can be negotiated to a degree	Direct contact and relationships with producers Regular & personal product information via newsletters 'surprise' element to box contents attractive, rustic appearance
	Inbound logistics	Operations	Outbound logistics	Marketing & Sales	Service

Figure 3: Roslagslådan value chain adapted from Porter (1985)

Each of the activities outlined in Figure 3 lead to added value either in terms of reduced costs or premium price qualities that have the possibility to translate into margins for profit. The online ordering and payment facility, plus the zero wastage and stock-on-hand imply cost benefits for Roslagslådan, however, most points of value in Figure 3 focus on providing quality local organic produce, personal service and a close relationship between farmers and their customers. Roslagslådan pursues a differentiation strategy in achieving competitive advantage in the hope of receiving a premium price for its product on the basis of local, organic produce delivered with high quality service from the farmer who grew it.

Product differentiation strategies are only worthwhile for a firm if the point of differentiation is perceived by the customer as a value for which they are then prepared to pay a premium price. The customer must believe that the premium price paid is more than offset by the value the product provides to the customer (Porter, 1985). Porter defines this value as either lowering buyer cost, or raising buyer performance. At the business-to-consumer level, this can mean lowering costs by saving time or extra money needed for additional preparation (for example, prepared foods or laundry services) as well as raising levels of satisfaction (for example, sporting the latest fashion trends, or being confident of where purchased food is coming from) (Porter, 1985).

Dan, Claudia and Ulrika all agree that Roslagslådan is not simply about selling vegetables, but that the product has a unique personality and value connected to it:

“Our customers are, above all, interested in buying our box because it is locally produced and they get to meet us, who grow and deliver the vegetables. Also, they like that it is ecologically produced⁵”

Ulrika, October 2009

“They buy our box because they want those kinds of products, and it takes too much effort to find these kinds of products via another way than our box... They can find organic products but they are not necessarily fresh because when things go through a shop, they are always a few days old by the time they meet the customer. When they buy from us they get things picked the same day or at worst the day before.”

Britt-Inger, September 2009

“We look at every tomato and potato as we pack so there's the quality check... For me, Ulrika packs the vegetables... then I pack them into smaller boxes here at my place, so there's two people checking all the vegetables. It's high quality checking.”

Claudia, October 2009

From the interviews held, customer perceptions of Roslagslådan are in line with the expected points of value:

“The box is good value. The family likes cooking. We like good food. We buy quality good food and don't look at the price per kilo. We like ecological food so yeah, we think it's a good value for the money. It's a good price for the taste. They are tasty. It's a different taste. If you buy a carrot out of a plastic bag from the supermarket there's not much taste, but if you buy a carrot from Roslagslådan it's a totally different flavour. The tomatoes really taste wonderful.”

Per (customer), November 2009

“[We buy it for] environmental reasons. Transportation is less, better qualities of the vegetables, much tastier, ecological is better. [It's] a feeling that you know what you get when you know the one it comes from and from where.”

Tove (customer), November 2009

During interviews, customers also mention the convenience of having vegetables delivered to their door, likening it to Christmas as they rummage through what's in the box that fortnight. As observed through deliveries, as well as customers making mention, some special treatment is offered as those with special diets or special requests were provided with variations of the standard fortnightly box contents. For its customers,

⁵ Translated to English from response in Swedish

Roslagslådan provides value in quality, local, organic produce which is grown locally and delivered by farmers they know personally. For this, they are prepared to pay more for the vegetables than they would pay at the local supermarket; but are they prepared to pay enough, and for how much longer?

Although Roslagslådan may command a value position in its market, this advantage can only be sustained if Roslagslådan is able to maintain barriers protecting this position (Porter, 1985). Porter (1985) outlines four key barriers firms can manipulate to maintain competitive advantage: sources of uniqueness such as first-mover advantage or interrelationships; cost advantage; multiple sources of differentiation; and if switching to a competitor creates a cost to the customer.

Roslagslådan is a first-mover in its local area and there is no direct competition from producers because all (three) producers that qualify by being organic, local and produce enough varieties of vegetables are partners in the Roslagslådan network. Additionally, Roslagslådan has a strong connection with the *Roslagsmat* community, adding to its brand recognition and community identity. Any future organic producer entering the geographic area is just as much a potential partner as a potential competitor.

Roslagslådan also lays claim to multiple points of differentiation. Farmers receive a great cost benefit by choosing the vegetables that are used in the box each fortnight. This leads to zero wastage and no stock-on-hand liabilities. Also, producers can guarantee the produce is fresh and seasonal each delivery, because what is abundant and of good quality for each delivery is used. For the produce Roslagslådan producers supply instead to local markets or supermarkets, some level of wastage and stock-on-hand would have to be accounted for. The close producer-consumer relationship could not be as easily emulated via a supermarket but it could be via a farmers' market or on-farm shop. However, coupled with the convenience factor of the vegetables being packed in a box and delivered to the customer's door (or central pick-up point), the experience can be considered unique.

There are, however, three key competitive weaknesses in the Roslagslådan operation. First, local supermarkets or large-scale distributors could begin to offer higher prices to local foodstuffs if consumer tastes begin to lean strongly towards the local, ecological market. Producers may then decide to shift supply away from Roslagslådan, particularly if they can sell at larger volumes, therefore not needing to split produce into various distribution channels, causing added transaction costs. Currently, producers can charge slightly higher prices via Roslagslådan distribution than they can when supplying local supermarkets (Dan, 2009; Ulrika, 2009). Second, current consumer tastes focussing on the 'quality' turn (Alkon, 2008; Clarke et al, 2007; Goodman, 2003) may not last forever. If consumers begin to see less value in local, organic, quality foods, or supermarkets start providing closer substitutes, Roslagslådan customers may become reluctant to pay such a price premium for the service. Third, Roslagslådan is a seasonal service, meaning that during those months customers do not receive deliveries from Roslagslådan, they must

seek substitutes elsewhere. Returning as a Roslagslådan customer each season requires transaction costs to the customer as well as high-levels of awareness and involvement. This is largely due to time costs and changes in daily schedules, shopping routines, cooking regimes and ways of payment. A threat to Roslagslådan suppliers exist of customers begin to perceive these costs as higher than the value received by this seasonal service.

Ultimately, Roslagslådan has a competitive advantage achieved via a differentiation strategy. The value Roslagslådan is perceived to provide – that of local, organic (quality) vegetables delivered personally by the farmers who grow them – is communicated and understood fairly clearly between network suppliers and customers. The business does have considerable potential to sustain this competitive advantage by being aware of and maintaining barriers to competition such as its first-mover advantage, interrelationships with other community focused organisations and branding, and the mix of service values that cannot be completely emulated by competing modes of distribution such as local supermarkets, farmers' markets or on-farm shops. The ever-present threat, though, is changing consumer demands and large-scale food systems realising the potentials for profit currently achievable by small scale local systems such as Roslagslådan. Similar types of commercialisation has been experienced by the organic food industry (Dantsis et al, 2009; Follett, 2009). However, the question remains whether Roslagslådan suppliers can create the said value to produce a profit within the premium price range its customers are willing to pay. This question is addressed in the following section by analysing the economic costs and benefits for producers supplying for the Roslagslådan network in comparison to supplying for their other possible modes of distribution.

6.1.2 Economic costs and benefits of a network

A key factor of Roslagslådan is that it can be described as a business network (Halinen & Tornroos, 2005; Eng, 2005). This is the main influence on the way the business operates. It is not a business entity in itself, but rather a collaborative arrangement between three separate businesses, or actors. Each of the three farms operate their Roslagslådan service with considerable autonomy, holding their own customer base, managing delivery routes, web pages and preparing boxes and newsletters. However, the farms do cooperate if there is a produce shortage, to decide whose route a new customer should belong to, and with web site maintenance. Communication is largely ad hoc via telephone and email, plus two official meetings annually. Income from Roslagslådan activity is not pooled but earned and accounted for individually. Roslagslådan contributes towards only a portion of each farm's total income.

There is, however, a closer collaboration between Saxens Örter and Forsbergs Gris & Grönt, where Forsbergs Gris & Grönt supplies all vegetables for the Saxens Örter deliveries. Saxens Örter writes the fortnightly newsletters for the Forsbergs Gris & Grönt deliveries:

“[Ulrika] has lovely vegetables and we work very well together. I can buy her vegetables at a very reasonable price... I write the recipes and she just has to print them out for her customers as well... We have made it that way and it really works. I always have fresh vegetables at home for me and my children and that's part of the value for me as well.”

Claudia, October 2009

The network also works collaboratively on the web site maintenance, with Claudia making amendments and repairs whenever needed. This occurs irregularly and small payments are made to Claudia for her duties on a case by case basis.

In analysing Roslagslådan's economic costs and benefits, both production costs and transaction costs will be considered. Particularly for Roslagslådan, production costs comprise administration; procurement; order processing and packaging; delivery; marketing; and labour costs. As Verhaegan & van Huylenbroeck (2001) point out, network operations also involve transaction costs, comprising information gathering, negotiating terms of the network, and controlling that the terms are adhered to. These costs should be minimised so that the benefits in creating the network outweigh the costs in creating it (Verhaegan & van Huylenbroeck, 2001).

It is difficult to quantify exactly the costs and benefits of operating Roslagslådan as suppliers do not explicitly separate Roslagslådan accounting from other business activity and per unit stock prices are not allocated. Therefore the following discussion will be largely qualitative with the inclusion of some estimated values garnered from the producers. A rough break-down of the costs per box are outlined in Table 2 below⁶.

Table 2: Breakdown of costs for Roslagslådan

Factor of production	SEK
Transport (fuel costs)	47,00
Packaging	3,00
Vegetables worth 190SEK including: 50% produce	95,00
35% labour @ 100SEK/hour	66,50
15% profit	28,50
Price of Roslagslådan for customer	240,00

⁶ This breakdown is an across-the-board description of costs for all three suppliers garnered from discussions with all suppliers. Individual supplier data varies slightly from the data displayed in Table 2. However, Table 2 depicts a representation of the cost breakdown of Roslagslådan as an entity.

6.1.2.1 Production costs

For its suppliers, Roslagslådan contributes between 15% and 20% of annual income. In addition to the time spent growing and harvesting vegetables (which is the same method for all types of distribution), each Roslagslådan delivery requires approximately 1.5 full days' labour. Over an annual average of 13 deliveries per year, Roslagslådan accounts for four out of a possible 48 working weeks in a year (European Commission, 2003). Further discussion in the labour wage rate section below highlights that calculating farm labour hours with respect to average cross-industry working hours is not realistically feasible as farm workers tend to subsist on considerably lower than average wage rate conditions in seasonal phases throughout the year (Kloppenburger et al, 2000; Verhaegan & van Huylenbroeck (2001). Despite this, to gather an idea of Roslagslådan's value as a contributor to farm income, it appears to produce at a sustainable level, as 15-20% of the annual income is created via approximately 12% of the annual labour hours available.

Compared to other channels of distribution used by its producers – farmers' markets, on-farm shops, selling wholesale to retailers and restaurants - Roslagslådan incurs additional costs at the administration, order processing, delivery and labour cost levels. Because Roslagslådan services many small, private customers as opposed to its suppliers' larger restaurants, retailers and supermarket customers, processing and matching orders as well as managing payment is more time consuming and demanding of detail. Packing time takes slightly longer than for on-farm shops and farmers' markets where produce is largely bunched in baskets for customers to collect themselves, however it takes slightly less time to pack for Roslagslådan compared to larger restaurant and shop customers, except for ICA supermarkets, where it takes approximately the same time. This, coupled with the service of offering slight variations in Roslagslådan contents to some customers, can be understood to result in a slightly higher packaging cost involved for Roslagslådan, albeit nominal.

Managing delivery logistics is one of the two largest and most time consuming costs during the Roslagslådan production process, however on further analysis these costs are well compensated through per-box revenues. The farmers are familiar with each customer location and the area in which they deliver, but each fortnight calls for slight changes to the ordering list, and therefore the delivery route, car packing and the time spent on deliveries. Using the largest route (Dan and Britt-Inger's) as the benchmark, with an average of 85 deliveries in a 300km route, using a reasonably fuel-efficient car of 10L petrol per 100km (Natural Resources Canada, 2009), each Roslagslådan box demands 0.4L of petrol at an average cost of 6SEK (Bensinpriser.se, 2009). This leaves 41SEK per Roslagslådan for vehicle maintenance, depreciation and leeway for weeks with less boxes delivered per kilometre driven.

The second considerable cost of production are the labour wage rates, which also are the least sustainable. When divulging the cost break-down for Roslagslådan, farmers pointed out that the accounted hourly wage rate of 100SEK is approximately a third of what

business-owners should demand from a wage rate. This 100SEK must also include social benefits to which all employed workers are entitled.

“Historically farmers have very seldom been able to take normal incomes if you count per hour, that’s just a fact”

Dan, November 2009

While Roslagslådan suppliers may receive a sustainable economic return for their efforts in accordance to a typical 48 hour working week (European Commission, 2003), if this income is broken down into the hours actually worked, labour conditions are far from competitive – estimated by farmers at a third of what should be expected. Maxey (2006) found a similar incident of acutely low-paid labour in his study of small-scale producer-suppliers in Canada and the UK, labelling them the “working poor” (2006:238). Timing is a significant factor in Roslagslådan deliveries:

“it is so special when you work with vegetables because you want to deliver them very fresh. As we deliver on Thursday we really should pick everything Thursday morning. But of course that's impossible. We do have to start earlier with some things we are able to pick a little earlier. That makes it a little difficult. You can prepare golf balls months ahead, but vegetables must be prepared immediately before.”

Dan, September 2009

Roslagslådan suppliers rely much on volunteer and unpaid family labour to process deliveries within expected time frames. The farmers note that due to the long hours and seasonality of the work, it is not feasible to employ additional labour because there are periods when there is plenty of work, but also periods when there is no work, and the businesses cannot afford to employ permanent staff for seasonal labour at the rate demanded by available seasonal workers.

6.1.2.2 Transaction costs:

Roslagslådan, as a network, has the potential to bring emergent sustainability properties to rural development as otherwise autonomous farms co-operate, forming synergies to be exploited (Oerlemans & Assouline, 2003). In Roslagslådan's case, the mutual benefit is brand recognition with its association with the *Roslagsmat* organisation, alluding to local, quality, organic produce, and the ability to pool certain resources, such as the online web site and marketing, administration, role-sharing and occasionally assisting each other in managing produce surpluses or shortages. These are all benefits enjoyed by Roslagslådan contributors that they wouldn't achieve independently. However, as Oerlemans & Assouline (2003) point out, these benefits come at a cost. It is costly for participating firms to gain the skills to effectively operate such a new marketing and distribution channel, as well as negotiate to ensure all participants agree on the terms, and to enforce that these terms are upheld. In the case of Roslagslådan, an EU grant was received, enabling Claudia to spend twelve months managing the initial development of

the network. This initial development involved analysing other similar box-delivery schemes and agreeing on how Roslagslådan would specifically emulate or reject services and values. A Roslagslådan website was created as an offshoot of the *Roslagsmat* web site, and Roslagslådan information and ordering pages were added to each suppliers' own web site. Enforcement costs at this stage are low because the network still only comprises the founding members who initially agreed the terms – communication is a relatively simple system with only three participants. This could post a considerable future cost is the network grows to include additional farms.

The EU grant succeeded in minimising the transaction costs for developing the Roslagslådan network and therefore contributed to its overall sustainability. Currently ongoing control and negotiation costs remain low due to the low number of network members. Each member farmer makes note of the little time and available funds vegetable producers have for developing their business. If it wasn't for the EU grant enabling Claudia to spend a full-time year on developing the project, it is doubtful the Roslagslådan network would exist. This raises the question as to whether subsidies and grants that aid the reduction of transaction costs involved in the development of new innovations contribute to sustainable systems, or allow unsustainable systems to form and perpetuate. At the firm-level, Roslagslådan's receipt of a grant for its development created the opportunity for each supplier to expand its potential market. The question of sustainability lies in how the network exploited the funding and created a sustainable business system. As with the labour rate issue raised above, the sustainable management of development grants is more contentious an issue at the industry level where improper or incomplete analysis could easily lead to government subsidies funding operations or industry areas that are inherently unsustainable.

Regarding the Roslagslådan business, the production and transaction costs involved in developing and operating the system are generally internally sustainable, and with respect to suppliers' alternative modes of distribution. The main areas challenging the sustainability of the network were unsustainable labour rates and limited resources available for business development. These two issues are largely problems at the industry-level as opposed to the firm-level, where the Roslagslådan has demonstrated considerable ability to maximise the utility of its resources.

6.1.3 Sustainable network relationships and management

In terms of Murdoch's (2000) definitions of network types in food systems, at the firm-level Roslagslådan can be understood as an horizontal network. The network is formed from three suppliers offering a similar product to a geographical market, collaborating chiefly for mutual marketing and distribution benefits. As there are currently only three key actors, all of whom were founding members, trust relationships are currently strong, and potential for flexibility in terms of last-minute favours or changes to routes, produce sharing and similar are easily managed ad hoc and with minimal transaction costs. Despite having only three members, there is considerable skill diversity within the network, as Dan and Ulrika hold production skills while Claudia has key capabilities in

project management. This 'structureless' form of network currently appears to work well, with flexibility and a low need of internal contracting aiding in smooth operations. However, as Oerlemans & Assouline (2004) mention, it is important for network structures to be well managed internally in order to be sustainable. While the current trust-based, flexible internal workings of Roslagslådan aid in easing operations, it could result in future difficulties as (and if) the network or its environment changes. For example, additional distributional routes, or producers come on board, are replaced or leave the network.

Two key challenges to the future sustainability of the Roslagslådan network are: one, problems with reciprocity as new partners join, and maintaining trust and effective ad hoc relationships with expanding memberships; and two, balancing member autonomy with the need to enforce converging aims and mutual learning.

First, if the current network membership changes problems with trust and reciprocity may arise as 'old' members and 'new' members vie for positions within the network. Oerlemans & Assouline (2004) note that it is important that all network members are and perceive that they are involved in network decision-making processes. If it is difficult for 'new' members to break 'old' member solidarities, trust and reciprocity can erode along with the ability to maintain network flexibilities due to current forms of ad hoc problem solving and the little need for internal contracting.

Second, currently each Roslagslådan member has significant autonomy as to the management of Roslagslådan operations and customers. Common values are shared and acknowledged, so there is little need for enforcement measures, as discussed earlier. With only three current members, two annual meetings plus ad hoc communication is enough to maintain information processing and learning between the members. However, if membership changes, need for managing this could become imperative, calling for added transaction costs within the network – plus extra time demands on producers. There also will become greater potential for conflicts. Roslagslådan does not currently have any key role facilitator or internal network manager and while this is not currently needed, if the network grows or changes, this could become a problem, threatening the whole sustainability of the system.

6.2 The social

6.2.1 Local added-value

Roslagslådan suppliers all make note that they would like to have more customers - or more farmers to service more delivery routes - to expand the operations. However, they also highlight that a key problem in realising this is that they are at maximum labour capacity for current deliveries.

“When we began, the main challenge was that everyone wanted to have the boxes but they all couldn't get it. And this is a nice problem,

but still a problem because we have to say no to those people who are outside our area. The gas is getting more and more expensive so we can't drive all across the country for just one box.”

Claudia, October 2009

When extra labour is needed, suppliers call on family help or volunteers because, as mentioned previously in the economic section, it is not economically feasible to employ additional labour. While Roslagslådan operates in clear, local geographic boundaries, it is not directly stimulating regional employment conditions.

Additionally, Roslagslådan services on average 150 customers per fortnight in an area with a population of approximately 23.000 (Norrtälje Kommun, 2009). There are no other local substitutes for Roslagslådan and therefore it is questionable as to whether Roslagslådan could be considered as significantly contributing to keeping income circulating locally.

6.2.2 Social reflexiveness

Conducting demographic and opinion surveys of the region is outside the scope of this paper, so effectively evaluating the level of social reflexiveness of Roslagslådan is difficult, however, it does warrant a short discussion at the firm-level. All suppliers highlight the benefits of Roslagslådan as being locally and organically produced with close contact between customers and producers, as well as a perceived 'preciousness' or added-value in the narrative and seasonality that goes with the vegetables that arrive in the fortnightly box. The same values and benefits are clearly reflected in customer responses:

“I think this is a great initiative to get [quality] and environmental [sic] friendly food. It creates good food habits by delivering vegetables adapted to season and you get a feeling for the food production and a connection to the earth.”

Tove (customer), November 2009

“You wouldn't buy Roslagslådan if you are used to semi-finished foods, if you're not used to taking care of vegetables that have soil on it... everything you buy in the supermarket today is washed, which is I guess convenient but a little bit artificial. If you aren't used to taking care of the vegetables or taking care of foods that aren't processed.”

Per (customer), November 2009

During interviews, both suppliers and customers were lucidly aware of what their values were – and were not – regarding growing and consuming vegetables, which they believed they acted upon through participation in the Roslagslådan network. While their values can be considered as 'good' and 'socially minded', this perspective may not be universal; others could consider them 'idealistic', 'elitist' or 'socially unreflexive' (DuPuis &

Goodman, 2005) and therefore not necessarily representative of the region. If so, the 'counter-hegemony' at play is not one bringing about greater equality in opposition to the perceived exploitative global agro-industrial systems, rather it manifests a power battle between two opposing world views, doing little to bring about greater regional social equality or political influence.

6.2.3 Social embeddedness and economic instrumentalism

As Hinrichs (2000) and Alkon (2008) predict, there does exist a trade-off in the Roslagslådan network between economic instrumentalism and social embeddedness. Conflicts arose for suppliers as they tried to balance personal relationships with customers (who often purchased produce from their farms via other channels as well) against demands that compromised the economic viability of the network. One considerable problem highlighted by all suppliers was the difficulty in managing isolated locations of loyal customers via other channels of distribution with optimal Roslagslådan delivery routes.

6.2.4 Sustainability criteria

Table 3 below is a discussion of Roslagslådan with respect to each criterion outlined in Table 1 – making the assumption that box contents are consumed by customers as intended by suppliers.

Table 3: Discussion of Roslagslådan with respect to social sustainability criteria from Table 1

Criterion	Roslagslådan
<i>Healthy: for a balanced diet and no contaminants</i>	Roslagslådan vegetables contain no contaminants and are organically produced. Box contents do support a balanced diet, and the minimum of 8 different varieties per box ensures a varied diet.
<i>Fairly or co-operatively traded</i>	There is considerable two-way communication between producers and consumers, with producers holding 'fair' control over prices and contents of each Roslagslådan. There is evidence that suppliers consider customer welfare when determining price and box contents.
<i>Non-exploiting of employees</i>	All Roslagslådan suppliers are self-employed and accept lower than average wage rates.
<i>Accessible: geographically and economically for consumers</i>	While the delivery aspect of Roslagslådan is perceived as very accessible by many customers, delivery routes and man-power of suppliers does restrict access for potential customers lying an infeasibly far distance outside of existing delivery routes. Assessing economic accessibility within the regional area is outside the scope of the project, however, customers have acknowledged that the non-monetary value of the box is worth the comparatively higher price paid.
<i>Encouraging knowledge respect and understanding of food and food culture</i>	Customers and suppliers engage in deep and frequent conversations about the origin, ways of preparing and storing the vegetables, as well as quality and learning about different or unusual vegetable families and species.
<i>Participatory: involvement more than just market transactions</i>	There is high customer involvement and loyalty from the customer point of view. Suppliers have voiced the want to include customers even further into the production process. To do this, more time and monetary resources are needed.
<i>Socially inclusive relationships: emphasizing responsibility, communication, and care for each other and the land</i>	As discussed above, there is a considerable level of communication, value-sharing and respect between customers and suppliers and with regard to the produce transactions. However, responsibility, management and all business activity remains on the supply-side.

6.3 The environmental

6.3.1 Production

All Roslagslådan suppliers use organically grown vegetables. Michelsen (2001) notes that at “the core of organic farming are production standards, which distinguishes it from other types of farming” (2001: 62) continuing that standards are agreed by organic associations themselves (such as IFOAM, the International federation of Organic Agriculture Movements) from which labelling and certification was created. There are no binding or internationally agreed standards, and labelling and certification is largely managed by the private sector. Producer membership is voluntary with the main aim being consumer information and communication (Michelsen, 2001). Roslagslådan is certified by KRAV, a Swedish organic label which certifies under organic farming standards decided by member companies (Ceije, 2009) with reference to Swedish law, EU regulations, IFOAM standards and accreditations, as well as KRAV's own values (krav.se, 2009). These member companies comprise farmers, processors, trade and also consumer, environmental and animal welfare interests with members ranging from large production companies and supermarket chains such as Arla Foods AB, ICA Sverige AB and Coop Sverige AB to smaller-scale producers and organisations such as Fältbiologerna and Everfresh AB (krav.se, 2009). KRAV labelling certifies producers and retailers who follow the standards set by KRAV to achieve their aim “to produce high-quality products in a sustainable manner and to do so in a credible and reliable way. The striving should be to respect natural processes and behaviour through the entire chain from farm to the final customer” (KRAV, 2009:4).

Roslagslådan suppliers chose to use the KRAV label as there is currently no other comparable organic label in Sweden. Suppliers note that using the label is a means by which their customers can have confidence in their products. Customers also highlight that it does give them this confidence.

As mentioned above, organic labelling systems are self-regulating (Michelsen, 2001) and KRAV is a private, therefore profit-seeking, company (Ceije, 2009; krav.se, 2009). While it is outside the scope of this project, it would be very interesting to investigate the standard agreement and certification processes as to what extent economic instrumentalism has an influence. Guthman (2004) argues that in organic labelling systems “[a]lmost all affect industry structures by favoring those players, many of whom were involved in creating the standards, who can most easily attain them. And, if the standards themselves fail to create an even playing field, the processes of verification can be even more troubling, imposing economic costs and discomfiting levels of surveillance on those who have least to gain” (2004: 525). On the other hand, Michelsen (2001) believes that there are benefits to be reaped through this self-regulating system because support for organic farming came from a social reaction against conventional farming methods, which were perceived as harmful to the health of Earth and humans: “organic farming is an example of interplay between state and civil society... also a counter-reaction from civil society based on values rather than strategic interests of politics or

economy” (2001:80). Self-regulation possibly enables organic farming to remain outside political interests; it can be managed by those who hold deep values connected with the social and environmental benefits of organic farming, rather than regulation and standardisation becoming simply a political tool.

Does KRAV treat all its member companies the same? Does the company place organic farming standards as the highest priority, or is it in social interest to have 'looser' standards for struggling farms to boost small-scale development? Alternatively, is KRAV foremost interested in sacrificing some standard strictness and some smaller members for economic gain? An evaluation on this would go far in ascertaining how environmentally sustainable Roslagslådan is – as well as gaining greater insight into the social and environmental costs and benefits of organic labelling systems. There is much to learn in this area.

6.3.2 Transport

This project is in collaboration with research on the delivery logistics of Roslagslådan, and emissions calculations are beyond the scope of this research. However, Roslagslådan suppliers do not use any energy-demanding technology for preserving or storing vegetables for delivery. This is largely due to the short time between picking and delivery. In comparison, during the summer months of August to October when Roslagslådan delivers organic tomatoes, the organic tomatoes available for purchase from local Norrtälje ICA supermarket are sourced from Vesland, Holland and Almeria, Spain. The tomatoes are transported by a cooled truck from the source to a central reloading place, then to the distribution point in Stockholm before arriving in Norrtälje. The transport process takes between three to six days from source to supermarket (Strömberg, 2009). While ICA deliveries may be able to take advantage of economies of scale in delivering the said organic tomatoes, it would be valuable to calculate whether such economies of scale are great enough to be considered less environmentally taxing than the logistical system of Roslagslådan.

Customer transport emissions must also be included in the assessment. Shopping at local supermarkets incurs emissions on the demand-side, whereas approximately 90%⁷ of Roslagslådan deliveries require no transport from the customer. While Coley et al's (2009) calculations may not be relevant for a delivery box scheme as small as Roslagslådan, it would be a valuable method in evaluating the transport emissions cost and benefits of door-to-door delivery versus central-point delivery, or complete customer collection, for the Roslagslådan network.

6.3.3 Packaging

In terms of packaging, Roslagslådan arrives to the customer in a locally produced wooden box, which is returned and re-used each week and collected by suppliers at the

⁷ Claudia's delivery route is to a central location as the Konsum supermarket in Rimbo. Each of her (on average) 15 customers must travel to meet her, but claim they usually coincide this trip with additional grocery shopping at the supermarket.

end of each season to be used the following year. Some of the more sturdy, larger vegetables are placed directly in the box, while the other more fragile items (such as tomatoes and beans) or smaller (for example, potatoes or beets) are packaged in smaller paper and plastic bags before being placed in the box.

“We pack a lot of stuff in extra paper and plastic bags – in addition to the wood boxes. In [another larger delivery system] they also have a recyclable wooden box, then one big plastic bag – everything goes in that. The plastic is good to keep the moisture in. But... to have potatoes and tomatoes all together it wasn't as easy for the customer, so we pack the different vegetables in different bags. If we have a cauliflower head, then it can go in without a bag... but to keep things together, and some products need protection, we do use extra packages. You must make some compromises.”

Dan, September 2009

While the packaging compromise dilemma outlined by Oki and Sasaki (2000) is real for the Roslagslådan suppliers, they also make note that customers treat the wooden boxes with considerable care, meaning that few are lost or broken. In addition, some customers will return the plastic bags with the boxes each fortnight so they can be re-used. Such social embeddedness encourages mutual consideration between suppliers and consumers that can have emergent positive effects – environmental, in this case. It could be argued that such respect for packaging may not manifest in larger, less personalised food systems or supermarket chains. Such larger food systems may also be subject to tighter packaging regulation as greater time and distances from producer to consumer may call for more durable and voluminous packaging, with little opportunities for direct re-use.

7. Discussion of the data

While much valuable qualitative data was gathered throughout the research process, the most difficult aspect was determining clear and representative quantitative data for Roslagslådan business activity costs. Roslagslådan suppliers are all 'family' businesses and therefore work hours and salary costs are not explicitly accounted for due to the significant contribution of volunteer labour that is vital for the business to run. Vegetable production is a seasonal career and small-scale, full-time farming is rarely a profession that can be disconnected from one's personal life – the working week is not guaranteed to be 40 hours between Monday and Friday. Because of these factors, business cycles are more erratic and salaries are not paid routinely, unlike what is typical in many other manufacturing or service industries. Therefore it is difficult to derive quantitative analyses that truly reflect the business situation.

Throughout the research process, several interesting points arose that were outside the scope of the project but warrant suggestions for future research topics.

It is questionable as to whether the Roslagslådan network would have materialised without the EU development grant. This is an important point when considering the sustainability of networks – whether the transaction costs of creating the network outweigh the benefits of operations. Without the EU grant the Roslagslådan network would have demanded a significant investment of resources from suppliers with very few (if any) spare resources to invest. However, once the grant was used to develop the project, the result is an economically sustainable operation. An interesting future research topic would be to determine those factors that most effectively determine best use of government grants for sustainable business development in rural and agricultural sectors.

One point that would contribute significantly to assessing the overall sustainability of Roslagslådan would be a detailed efficiency calculation and comparison of transport and emissions from the Roslagslådan network and its direct substitutes. This point was also seen as important by many members of the Roslagslådan network.

Further research into the structure and impact of the Swedish (and EU) organic labelling industry would be interesting. Particularly to understand the main motivations behind criteria formation, certification and enforcement.

And finally, a thorough sustainability assessment of Roslagslådan network would include deeper research into the system's social reflexiveness. While all members of the Roslagslådan network share similar values and a high level of involvement, understanding whether this is a minority sentiment or something with great potential for the region would make much contribution as to how food supply systems such as Roslagslådan can contribute to regional social sustainability.

8. Conclusion

In achieving the outlined objective of exploring the extent to which an AFS such as a direct-selling SFSC contributes to Sustainable Development, with a focus on the economic, the following discussion outlines the key research findings.

Economically, Roslagslådan commands a strong competitive advantage for its suppliers within its market, as well as taking advantage of emergent benefits of network collaborations. The network contributes to a significant amount of income for suppliers without demanding unreasonable levels of resource investment – compared to suppliers' alternative channels of distribution. The main threats to the Roslagslådan network's economic sustainability is changing consumer perceptions of value and structural weaknesses within the network management if it would change or expand. Additionally, below-average labour rates are an obstacle for Roslagslådan suppliers as they reach full delivery capacity, while low demand for vegetable farming in the Roslagen area makes expanding the network difficult. Roslagslådan does face key hurdles in its perpetuation, but the case does demonstrate the ability for small-scale food producers to exploit AFS methods to support economic sustainability.

The concept of Sustainable Development calls for a balance between economic, social and environmental parameters. This paper's analysis of the social and environmental is not final or absolute. However, discussion concludes that key values of Roslagslådan suppliers and customers are shared, which revolve around the supply of local, organic, traceable vegetables, where value is gained through strong relationships with the product and with the supplier. Both suppliers and customers place Roslagslådan in direct opposition to the 'conventional' food supply system, claiming it is 'better'. While this paper highlights the need for deeper research in how socially sustainable such community, network and food relationships are, Roslagslådan performs well with respect to social sustainability criteria outlined in published literature. Roslagslådan's performance environmentally demands much deeper research in terms of transport and emissions comparisons, the environmental impact of production methods, and in relation to the organic labelling industry structure. However, with respect to AFS theory descriptions of social and environmental sustainability, Roslagslådan could be displayed as a close manifestation of the ideal. There is much to learn as to whether the ideal professed by AFS supporters achieves in reality an effective level of sustainability.

This paper, via a case study method, aims to provide strong and relevant empirical evidence towards forming valid theory – rather than proposing theory itself. Eisenhardt (1989) notes that despite the academic world generally claiming the opposite, case study research can lead to the development of grounded and internally valid theory, just as experimental methods claim to do: “each case is analogous to an experiment, and multiple cases are analogous to multiple experiments” (1989: 542). The above sustainability findings are closely comparable to the research findings of Maxey (2006), who noted that while at the firm-level the studied farms displayed sustainable business models and behaviour benefiting the promotion of sustainable food supply systems, they

suffered with respect to the wider industrial, political and social environments that caused weaknesses and threats to the survival of the farms. While two cases is not enough to develop fully-fledged theory, further case-based research in the area of AFS sustainability could aid in highlighting a pattern. If small-scale food supply systems such as the cases presented here tend to experience the same strengths and weaknesses, this phenomenon has the potential to contribute much to sustainable agriculture and rural development policy design.

The results derived from this project offer no hard and fast answers - or quantifiable measurements - to the 'absolute' level of sustainability achieved by the Roslagslådan network. Or if this level can be deemed universally good or bad. For every aspect being analysed, two more issues arise for discussion and the academic world continues to have much difficulty in agreeing to define the Sustainable Development concept. Sustainable Development is a dynamic, ideological development process rather than a static, ideal 'state of being'. The concept of Sustainable Development calls for an holistic approach in order to balance the benefits of economic, social and environmental progress. This notion of 'balance' hints at the need for trade-offs and compromises. For example, what is economically beneficial for a system may be socially or environmentally detrimental – and vice versa. Optimal levels of these trade-offs or compromises can only be understood when understanding the entity as part of its greater, interconnected system. In order to conduct deep analysis, boundaries must be drawn as the entity is broken down to discrete, simpler, more measurable and definable parts. Once such boundaries are drawn and reductions are made, the 'measured' level of sustainability no longer accounts for how the entity works holistically. Positive and negative externalities may remain unaccounted for, meaning the 'absolute' sustainability of the entity remains elusive.

Many label the Sustainable Development model as weak and ambiguous. While this is often seen as a shortcoming, a more rigid, formulaic model could be a restrictive and less comprehensive analysis tool. The Sustainable Development model raises the aspects that must be considered and balanced when aiming for sustainability. It is flexible and can be weighted with respect to the context surrounding each case in question. The Sustainable Development model is not a rating or grading formula.

It is doubtful that an organisation, society, network or phenomenon of any kind could ever be assessed as holistically sustainable or not. Studies such as this project do not aim to arrive at such dichotomous answers. Rather, they identify points of sustainability strengths and weaknesses that should be implemented or improved upon along developmental paths approaching sustainability. As more knowledge of this area is formed, new discourses can be created, framing policy and development methodology in more sustainable ways.

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