An overview of sustainable business models for innovation in Swedish agri-food production

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ABSTRACT
Companies in the agri-food sector are under increasing pressure to adopt sustainable business models that consider not only economic but also both social and environmental aspects. This paper examines how Swedish food producers use sustainable business models to innovate their businesses. The empirical data comes from a telephone survey with 204 companies and from case studies of 4 companies. A conceptual framework regarding sustainability-oriented innovation (SOI) and a eight sustainable business model archetypes are used to map and analyse the sustainability innovation practices and the sustainable business models. The results show a surprisingly sustainable business focus taken by many companies, which is not only on optimization, but also on organizational transformation and on systems building. The results show the companies vary as far as which archetypes they match. The most common archetype matches are ‘Maximise material and energy efficiency’ and ‘Adopt a stewardship role’. Only 10% measure success solely in financial terms, while 80% measure success in financial terms as well as social and environmental terms. Another conclusion is that companies in the agri-food sector have unique characteristics and the value intention of the entrepreneurs is an important building block in sustainable business model innovation.

1. Introduction
Sweden is often pointed out as a country that has come very far when it comes to sustainable food production in many areas such as; environmentally awareness, animal welfare, low use of antibiotics and access to high-quality natural resources (Swedish Government 2016). OECD (2018, p. 12) states that: ‘Swedish legislation, which reflects consumer and citizen preferences, sets norms and standards for food safety, environment and animal welfare that is well above EU requirements in many areas of agriculture and horticulture. Swedish consumers and citizens have a high level of confidence for the Swedish agricultural and food system’. Hence, by studying the Swedish context, we can identify barriers, challenges and possibilities that can be relevant in other countries as well.
In Sweden, the agri-food sector has undergone significant structural changes in the last 20 years. The surviving food producers have become larger through internal growth and/or mergers and acquisitions (Swedish Board of Agriculture 2018). Others have been forced into subcontractor roles with diminished managerial influence on production goals and activities. This power asymmetry, combined with low-quality business relationships, can lead to sub-optimization of resources and a reduced capacity to identify and satisfy consumer needs (Benton and Malone 2005; Schulze-Ehlers et al. 2014). Furthermore, some larger companies in higher positions in the food value chain may not share smaller companies’ interest in social and environmental sustainable innovation. Even when such sustainable innovation (sometimes in response to consumer pressure) improves a product’s quality, these larger companies may be disinclined to adopt the innovations for use in their production activities, delivery systems and product portfolios. They hesitate primarily because of fear of greater logistics complexity and higher costs. In some instances; however, these structural changes in the agri-food sector have resulted in more cost-effective production and distributions systems, although with survival and profit still greater concerns than social and environmental issues. Thus, many stakeholders (e.g. consumers, consumer rights organizations, the media and citizens) are increasingly concerned about the low degree of sustainable social and environmental innovation in the food value chain.

Traditionally, agri-food companies have used conventional business models that emphasize production efficiency and economies of scale. However, for many companies these conventional business models have not changed the situation with declining profits. In recent years, more Swedish agri-food companies are developing their business models towards sustainability in order to meet the international low-cost competition with quality production and products.

The topic of this paper, sustainable business models in the agri-food sector, is important since many global challenges are linked to social, environmental and economic sustainability in food production. Research shows that by 2050, worldwide food production must increase by 70% (FAO 2009; Öborn et al. 2011; Doberman and Nelson 2013). Other research shows that sustainable development efforts in the agri-food sector, which improve the nutritional quality of our diets, can have positive effects on our health (Benbrook et al. 2013; Średnicka-Tober et al. 2016). The European Union’s Research and Innovation Programme ‘Horizon 2020’ (European Commission 2011) and the United Nations’ sustainable development goals (Griggs et al. 2013; United Nations 2015) call attention to the need for more research and innovation on food security and sustainable agriculture. There is also considerable research on the need to improve agricultural adaptation to climate change, especially in food-insecure human populations (e.g. Lobell et al. 2008).

For researchers, the sustainable business model (SBM) is a useful analytical tool for examining how organizations can create environmental and social as well as economic value in various settings – from the single company to the entire value network (Lambert & Davidsson, 2013; Zott et al. 2011). As Boons et al. (2013) conclude, business models are useful for the creation and study of sustainable innovation. However, research regarding business models have often focused on the media, information technology, and biotechnology industries (Johnson 2010), and has not paid much attention to the agri-food sector. The existing research on SBMs in the agri-food sector has often been conducted in developing
(i.e. less developed or underdeveloped) countries rather than developed countries (e.g. the United States and Europe) (Beuchelt and Zeller 2012). It should also be noted that, with respect to sustainability, the agri-food sector is different from other industries for several reasons. Food from animals and plants must meet specific (and various) welfare, health and safety requirements. Production, and often distribution, is generally connected to a specific geographic area, where nature and climate have important influence on production. Even though a recent structured literature review reveals an increasing number of research articles that examine business model innovation, including the sustainable business model (SBM), in the agri-food sector (Tell et al. 2016), there is a need for more research.

To fill this gap, the purpose of this paper is to examine how Swedish food producers use sustainable business models to innovate their business activities. We will map, categorize and further our understanding of the development of sustainable business models and the orientation of the sustainability innovation practices and processes. The research questions are: (i) which sustainable business models archetypes do Swedish food producers use?, (ii) how do they prioritize among these archetypes? and (iii) how do they measure business success?

The rest of the paper is organized as follows. We present our theoretical framework primarily based on sustainability-oriented innovation (Adams et al. 2016) combined with the eight SBM archetypes developed by Bocken et al. (2014). The theoretical framework is followed by a presentation of our research methods; a survey to 204 food producers and case studies of four producers. Following, we present and discuss our findings. We conclude the paper with theoretical contributions, practical implications and proposals for future research.

2. Theory

The field of sustainability is a relatively new discipline that has developed over the last 15–20 years (Coad and Pritchard 2017). In an HBR article from 2009 (Nidumolu et al. 2009, p. 1), the authors showed that 10 years ago, sustainability became innovation’s new frontier and ‘sustainability is a mother lode of organizational and technological innovations that yield both bottom-line and top-line returns.’; and this has escalated even more the last decade. The majority of businesses are now well aware of the importance of sustainability, and it is the key driver of innovation, even though it is a challenge in many aspects. The challenges include not only, obvious parts such as; products, processes, technologies and business models but also the more abstract dimensions like; cognitive, psychological and organizational challenges (Sharma 2017).

The remaining part of the theory section is organised in the following sections; sustainability in the agri-food sector, sustainability-oriented innovation, sustainable business models and eight sustainable business models archetypes.

2.1 Sustainability in the agri-food sector

When it comes to sustainability in the agri-food sector, it is of vital importance in this large sector which represents a significant part of the EU economy accounting for about 4.4% of total employment in EU-27 (Eurostat 2017). Many businesses in the agri-food sector, often small family-owned businesses with primary production as the dominating part of the business, need new ideas and approaches to become more profitable at the same time as
they are exposed to external and internal pressure to become more sustainable (Tell et al. 2016). External pressure can be increased competition and pressure from special groups and government regulation-legislation. Internal pressure can come from management, shareholders and employees to build a business on sustainable values.

There is also forces working in the opposite direction, contributing to an increasing ‘unsustainability’ of the agri-food sector already identified by Fritz and Matopoulos in (2008), which are still valid:

- A globalization of the agri-food industry that results in increased imports and exports.
- Consumer changes in consumption, resulting in a larger demand of food products, often out of season, that are processed at longer distances.
- The concentration of the sector has resulted in an ever-increased power imbalance in favour of retailers.
- Major changes in delivery patterns with most goods now routed through supermarket regional distribution centre’s using larger heavy goods vehicles.

Recent research (Cagliano et al. 2016) has identified three main, integrated, challenges for sustainability in the agri-food sector. First, the interdependency between food production and environmental, human and physical resources. Second, the important role – sustainability and health aspects – of food for humans. Third, the special characteristics of the food supply chain, with companies of different size and different sustainability focus.

Despite the pressure to raise efficiency and lower costs from strong actors in the food value chain, many agri-food companies strive to conduct a sustainable business from social and ecological perspectives as well as from an economic perspective. The conscience of the owners and/or the managers of the agri-company can be an important factor for the development of sustainability-oriented innovation (Cagliano et al. 2016.) Walker has identified this as a values-based driver (Walker 2012, 2014). Further, research has also suggested that many agri-food producers have a strong value intention to conduct their agri-business in a sustainable way (Barth et al. 2017). Explanations for this could be that many agri-companies are family businesses, rooted in their communities and strongly connected to the land of the ancestors (Barth et al. 2017). The owners/managers have experienced the effect of their actions on their land and production. They have accepted a responsibility for coming generations.

Taken together, the businesses in the agri-food sector is facing difficult challenges – but has also unique opportunities to develop sustainability-oriented innovation and sustainable business models which create value in other ways than low-cost production.

### 2.2 Sustainability-oriented innovation (SOI)

In the existing literature, there is a lot of uncertainty what sustainability really means and how it can be achieved and there exists a variety of different conceptualisations, for example circular, green, eco, environmental, etc.

Consequently, the link between innovation and sustainability is still not well developed (Neutzling et al. 2018). Further, Adams et al. (2016) write ‘previous work tends to
treat sustainability dichotomously (sustainable/not sustainable), rather than embedding sustainability-oriented innovations as a dynamic, unfolding process that is achieved over time’ (p. 181). Taking this perspective, that sustainability is a journey and that organisational change happens over time, creates an interesting possibility to map the orientation of the sustainability innovation practices and processes. In the framework by Adams et al. (2016), the authors, after reviewing scientific literature published 1992–2012, divide their framework in three dimensions (from diminishingly unsustainable to increasing sustainable). The first dimension, technical/people, is about a movement in the literature from the focus on technology, that is ‘set of tools’ to a recent focus on people-centred innovation. The second dimension, stand-alone/integrated is internal and describes how ‘innovation for sustainable manufacturing has moved from end-of-pipe, stand-alone solutions to modes of practice that require sustainability to be more deeply embedded in the culture of the firm’ (p. 183). The third dimension, insular/systemic, reflects the firm’s view of itself in relation to a wider socio-economic system beyond the firm’s immediate boundaries and stakeholders.

These three dimensions then constitute three SOI approaches on the journey to a sustainable business: Operational optimization, Organizational transformation and System building that a firm can have when it comes to innovation objective, outcome and relationship, defining the sustainability of the business (Table 1).

### 2.3 Sustainable business models

In connection to the development of the sustainability-oriented innovations field, an increasing number of scholars frame it as a business model challenge (Rohrbeck et al. 2013). Since the mid-1990s, theoretical and empirical research on business models has steadily increased (Osterwalder and Pigneur 2012). Most of this research addresses the importance of business models for companies’ competitiveness, renewal and growth (Chesbrough and Rosenbloom 2002; Johnson 2010; Teece 2010; Lambert and Davidson 2013).

In practice, a popular framework (the Business Model Canvas) has been developed for companies to envision and implement SBMs. Researchers have also used a variety of business model definitions and settings (Johnson 2010; Zott et al. 2011; Osterwalder and Pigneur 2012). The importance of competitiveness, development, and growth in business models is a central issue in all this research (Chesbrough and Rosenbloom 2002; Johnson 2010; Teece 2010; Lambert and Davidson 2013). As various researchers have

| Approach                          | Innovation objective | Innovation outcome | Innovation’s relationship to the firm |
|-----------------------------------|----------------------|--------------------|--------------------------------------|
| Operational optimization: doing more with less | Compliance, efficiency ‘doing the same things better’ | Novel products, services or business models ‘doing good by doing new things’ | Reduce harm, incremental improvements to business as usual |
| Organizational transformation: doing good by doing new things | Novel products, services or business models ‘doing good by doing new things’ | Creates shared value, fundamental shift in firm purpose | Creates shared value, fundamental shift in firm purpose |
| System building: doing good by doing new things with others | Novel products, services or business models that are impossible to achieve alone ‘doing good by doing new things with others’ | Creates net positive impact, extends beyond the firm to drive institutional change | Creates net positive impact, extends beyond the firm to drive institutional change |

Table 1. A simplified model of SOI (taken from Adams et al. 2016, p. 185).
noted, companies may follow multiple business models (e.g. Casadesus-Masanell and Tarziján 2012; Aspara et al. 2013). This may be the case, for example, when companies are involved in different customer segments, compete in different markets, or produce/sell a variety of products.

Researchers have commented that a narrow focus on profitability without more attention paid to social and environmental sustainability can even limit a company’s achievement of its economic goals (Kiron et al. 2013; Schaltegger et al. 2015). Therefore, researchers have proposed alternatives to the traditional business model with its focus on maximising growth and revenues and on minimising costs. One alternative model is the SBM that is based on the network approach (Lawson et al. 2008; Boons and Lüdeke-Freund 2013; Breuer et al. 2016) and the value-net approach (Kähkönen 2012). The SBM is a business model that analyses not only how organizations produce and deliver goods and services, but, at the same time, how they contribute to the betterment of society – environmentally and socially. Frequently, an organization with a SBM is part of, to a greater or lesser extent, a community or region that highly values the sustainable society and the sustainable environment.

Many researchers have called for more studies on SBMs (Stubbs and Cocklin 2008; Boons and Lüdeke-Freund 2013; Boons et al. 2013; Upward and Jones 2016; Breuer et al. 2016). Boons and Lüdeke-Freund (2013, p. 11) write: ‘literature on sustainable innovation is hampered by a lack of conceptual consensus.’ Therefore, in their review of 87 journal articles on SBMs (published between 2000 and 2010), these authors identify the following elements of a generic business model concept (p. 11):

1. Value proposition: what value is embedded in the product/service offered by the company
2. Supply chain: how upstream relationships with suppliers are structured and managed
3. Customer interface: how downstream relationships with customers are structured and managed
4. Financial model: costs and benefits from (1), (2) and (3) and their distribution across business model stakeholders

These four business model elements, when combined with a perspective on social and environmental sustainability, describe the SBM. Organizations committed to such sustainability integrate their social, environmental, and economic activities in order to create value for their customers and for society.

This interest in social and environmental sustainability is not new. Thirty years ago, the Brundtland Report called for sustainable development that meets ‘the needs of the present without compromising the ability of future generations to meet their needs’ (WCED 1987, p. 43). Many researchers argue that more leadership is still needed around the issue of social and environmental sustainability (e.g. Kurucz et al. 2017).

Because of this increased focus on social and environmental sustainability, many companies worldwide have taken a greater interest in sequential business model innovation in which they refine an existing business model or launch a new one. One of the new tools promoted for this work is the Strongly Sustainable Business Model Canvas (SSBMC) (Jones and Upward 2014; Upward and Jones 2016). In practice,
a stewardship style of leadership is required for use of the SSBMC in which leaders understand their role as temporary custodians of power. Such leaders are committed to achieving value for all organizational stakeholders, including society (Harvey 2001; Bocken et al. 2013).

When focusing sustainable business models, Barth et al. (2017) have proposed that a fourth building block should be added to the previously defined building blocks of business models: (i) value proposition, (ii) value creation and delivery and (iii) value capture (Osterwalder and Pigneur 2005; Richardsson 2008; Bocken et al. 2014), namely (iv) value intention. Many agri-firms are owner-managed family businesses. The owners regard themselves as stewards or custodians of the company, the property, and the environment, with a responsibility for living and non-living things. Research regarding sustainability-oriented innovation also stress the importance of intentional changes to the philosophy and values of the organization (Adams et al. 2016). To include value intention of the owner-manager in the conceptual framework, could present important insights of potential trade-offs and barriers when addressing growth ambitions based on social, environmental and economic aspects.

2.4 Eight sustainable business model archetypes

Our research framework, which we used to answer our research questions stated above: (i) ‘which sustainable business models archetypes do Swedish food producers use?, (ii) how do they prioritize these archetypes? and (iii) how do they measure business success? are mainly based on Bocken et al.’s (2014) eight SBM archetypes. In turn, they build their archetypes on the nine business model ‘building blocks’ of the Business Model Canvas that Osterwalder and Pigneur (2012) list and that Boons and Lüdeke-Freund (2013) reference. Among the blocks most relevant to our study are value propositions, key activities, key partnerships, and revenue streams. Building on this key tool for the analysis of business models, Bocken et al. (2013) add sustainable social and environmental activities. They (p. 44) define SBMs as follows:

Innovations that create significant positive and/or significantly reduced negative impacts for the environment and/or society, through changes in the way the organisation and its value-network create, deliver value and capture value (i.e. create economic value) or change their value propositions.

Table 2 presents Bocken et al.’s (2014) eight SBM archetypes. These archetypes are useful for identifying patterns and attributes that facilitate the categorization of the business model innovations for social and environmental sustainability, and, as they explain, for “develop[ing] a common language that can be used to accelerate the development of sustainable business models in research and practice” (p. 42).

2.5 A combined SOI and SBM archetypes framework

In this article, we combine the framework by Adams et al. (2016) focusing on sustainability-oriented innovations (SOI) with that of Bocken et al.’s (2014) eight different SBM archetypes (see Table 3).
The idea behind combining these two frameworks is to categorize the business model innovations and study the organizational change (the orientation of the sustainability innovation practices and processes) taken by companies in the agri-food sector of Sweden.

3. Methodology

The empirical data in this study is based on both a structured survey and on case studies including semi-structured interviews. In the following sections, we will first present the structured telephone survey and in the following section the case studies.

3.1 The telephone survey

The empirical data presented in this paper is based on a survey to 204 agri-food producers in Sweden. The agricultural entrepreneurs were identified from the Agricultural Register reported the year 2015 to Statistics Sweden. The criteria for inclusion in the study were to have reported being a full-time agricultural entrepreneur with at least 1 Million SEK in turnover for the year 2014.

Both primary data and secondary data have been collected in the study. Secondary data about the agri-food companies from Statistics Sweden includes where the
companies are situated (county), firm characteristics such as the company’s operating orientation (crops, dairy etc.), turnover and information about the entrepreneurs with contact details, such as telephone numbers to the entrepreneurs.

We began our research in the spring of 2016 by telephoning the agri-food companies to ask them to participate in a survey on the production and sale of livestock or crops (or processed products derived from livestock or crops). We were primarily interested in learning about their use of the SBM. The telephone calls lasted for about 20–30 min and the respondents had the opportunity to make completions in her/his own words beside the questions with pre-structured alternatives to answers.

The results from this initial telephone contact were as follows: 204 companies out of 725 companies agreed to participate, which gives a positive response rate of 28%. 411 companies did not respond, 108 did not want to participate and 2 were unable to complete the survey. Thus, of our final sample of 204 companies, 104 were food producers with a main focus on crops and 100 were food producers with a main focus on livestock. Further, characteristics of the 204 agricultural companies are that 47% have a turnover between 1 and 5 million SEK, 37% have a turnover between 5 and 10, 12% have a turnover between 10 and 20 and 4% have a turnover between 20 and 50 million SEK.

Prior to conducting our telephone survey, we mailed the companies descriptions and examples of the eight SBM archetypes. In this mailing, we explained our intention was to learn which of the eight SBM archetypes matched the companies’ business models. We then telephoned the company representatives and asked them to respond to three statements for each of the eight SBM archetypes. Respondents used the following scale to indicate their agreement/disagreement/neutrality with the statements: 1 = completely agree; 2 = partly agree; 3 = neutral; 4 = partly disagree; 5 = completely disagree. The Appendix presents the 24 statements (eight archetypes × 3 statements).

We also asked the company representatives to select the statement that best describes how their companies measure success. We offered the following choices:

(a) We measure success solely in financial terms (profit, turnover, etc.)
(b) We measure success primarily in financial terms (profit, turnover, etc.), but we also take into account social benefits (increased happiness, well-being, etc. of employees and customers), and/or environmental benefits (e.g. climate change).
(c) We measure success primarily in social benefit terms (increased happiness, well-being, etc. of employees and customers), and/or environmental benefits (e.g. amelioration of global climate change), and secondarily in financial terms (profit, turnover, etc.).

### 3.2 The four case studies

We also conducted case studies at four agri-food companies in Sweden. The four agri-food companies where chosen to get a deeper understanding of SBM archetypes, since they all have developed their business models and regard sustainability as an important part of their business models.

Company A is a milk producer that sells milk to a large, multinational dairy cooperative that processes and sells a wide range of dairy products in many countries. Company A also runs a mechanical workshop and a custom hire service.
Company B is a dairy cooperative company owned by small and medium-sized milk farms. The dairy’s main business is production and selling of high-quality cheese.

Company C is a meat producer and farm charcuterie, which sells fresh and processed meat, and offers courses to the public on sausage craftsmanship, food waste minimisation and nutrition.

Company D is a vineyard and winery that sells wine to distributors, and operates a conference hotel.

For these case studies, we interviewed the owners/managers of the companies. Initially, they were asked to tell their story of the companies in their own words. Then we used a semi-structured interview guide with open-ended questions. We asked questions on company history, past and current business activities, customers, partnerships, networks and business models. We also asked about each company’s goals, organizational culture, values, and work with social and environmental sustainability. These interviews, which lasted approximately 45 min, were audiotaped, partly transcribed and analysed through content analysis. We also used official secondary data from the companies, as a complement to the interviews.

4. Results and analysis

We present our results in three sections. Section 4.1 presents the results from the telephone survey in four tables (Tables 4–7). Section 4.2 presents results from the four case studies in narrative form. Section 4.3 integrates the results from both the survey and the case studies within the combined framework of sustainability-oriented innovations (SOI) (Adams et al., 2015) and the eight different SBM archetypes (Bocken et al. 2014).

4.1 The telephone survey

Table 4 presents a summary of the telephone survey results on the use of the eight SBM archetypes. To be able to get a full match, the respondent should have given the answer ‘fully agree’ on the three items related to one of the eight archetypes presented in the survey.

(a) No full match to any archetype: 50% (102/204)
(b) One archetype fully matched: 19% (38/204)
(c) Two or more archetypes fully matched: 31% (64/204)

| Number of companies | Number of sustainable business models that fully match the eight archetypes |
|---------------------|----------------------------------------------------------------------------|
| 4                   | 6                                                                          |
| 12                  | 5                                                                          |
| 13                  | 4                                                                          |
| 12                  | 3                                                                          |
| 23                  | 2                                                                          |
| 38                  | 1                                                                          |
| 102                 | 0                                                                          |
| Total: 204 companies|                                                                            |
The result above show that only 50% (102/104) of the companies fully match any of the archetypes. This is somewhat remarkable in a country such as Sweden where social and environmental sustainability receive so much attention. In fact, in 2015 Sweden was named as the most sustainable country in the world, ahead of 59 other countries (RobecoSam 2015). Are the archetypes relevant for the agricultural industry and valid as analytical tool or are there other forms of archetypes and combinations in this sector that would be more suitable to capture the complexity in the sector? As previously has been discussed, the ‘value intention’ is an important building block in the development of sustainable business model innovation in the agri-food industry. (Barth et al. 2017) since companies in the agri-industry have unique characteristics as described above.

Further, 31% (64/204: Table 4) of the food producers match to more than one of the eight SBM archetypes. At the high end, four companies match to six archetypes, and 12 companies match to five archetypes. This is consistent with the research that companies may follow multiple business models (e.g. Casadesus-Masanell and Tarziján 2012; Aspara et al. 2013).

Table 5 shows the distribution match of the SBM archetypes by companies. The total number of companies SBMS are 258 rather than 204 because various companies use more than one SBM archetype, a phenomenon that has been noted in the literature (Bocken et al. 2014).

The archetype ‘Maximize material and energy efficiency’ is one of the two mostly matched (57) of the eight SBM archetypes (Table 5). This is not surprising since the agri-food sector in Sweden has been under pressure for several decades. The focus has been to survive and to be as effective as possible with given resources has been of great importance.

To ‘Adopt a stewardship role’ was matched by 50 of the companies as a SBM archetype (Table 5). This finding is consistent with stewardship theory where a commitment to all stakeholders, rather than simply to self-interest, is an owner/manager priority (Harvey 2001; Bocken et al. 2013). Stewardship is a fundamental ethic among agri-food producers.

The archetype ‘Re-purpose the business for society/environment’ is one of the two least matched of the eight SBM archetypes together with the archetype ‘Encourage sufficiency’. Both these archetypes focus on collaboration with society to a larger extent and such a collaboration might take time from a survival focus in the companies.

The finding that all eight archetypes are represented, is interesting when it points to the heterogeneity of the agricultural firms. This seems not to be the case in other

### Table 5. Distribution of companies’ SBM archetypes.

| Sustainable Business Model Archetypes | Number of Matches by Companies |
|--------------------------------------|-------------------------------|
| 1. Maximise material and energy efficiency | 57                            |
| 2. Create value from waste           | 29                            |
| 3. Substitute with renewables and natural processes | 35                            |
| 4. Deliver functionality, rather than ownership | 27                            |
| 5. Adopt a stewardship role          | 50                            |
| 6. Encourage sufficiency              | 11                            |
| 7. Re-purpose the business for society/environment | 11                            |
| 8. Develop scale-up solutions        | 38                            |
| **Total:** (some companies chose more than one primary SBM) | **258**                      |

Note: The “258” calculation exceeds the sample of 204 companies since many companies stated they use more than one SBM archetype.
industries. For instance, in a review by Klewitz and Hansen (2014) they show that traditional SME’s is a homogenous group when it comes to SBM.

Table 6 is an analysis of the companies’ SBM archetypes grouped by company size in terms of annual turnover.

Most companies have no primary SBM. This is true, regardless of company size in terms of annual turnover or in terms of product type (whether derived from livestock or crops). Most companies select ‘Maximise material and energy sufficiency’ as the SBM archetype that most closely matches their SBM (96 % = (96 + 76 + 24)/204: Table 6). The second most common business model is ‘adopt a stewardship role’ (41 % = (76 + 8)/204). As previously mentioned companies may follow multiple business models (e.g. Casadesus-Masanell and Tarziján 2012; Aspara et al. 2013) and that is also in line with the results of this survey.

Table 7 tabulates the companies’ success measurements in terms of financial success, social benefit or a combination of the two.

Most of the companies, 81 % (165/204: Table 6), measure success primarily in financial terms but also take into account social and environment terms secondarily. An additional 9% (18/204: Table 6) prioritize social and environmental benefits. Only 10% (21/204: Table 6) measure success solely in financial terms.

Sustainability is focused more and more in society and the agri-sector has historically worked to a large extent with the future in mind. The inherited tradition of preserving land for future generations and the caring for animal welfare, etc. in Sweden makes this result seem relevant and not surprising.

4.2. The four case studies

In order to exemplify different SBM archetypes used by Swedish agri-food companies, and relate them to the three SOI-approaches, we will present four cases in the following section.

Table 6. Primary SBM archetypes at the companies (by annual turnover).

| Number of companies | Size in Turnover (Swedish crowns: SEK) | Primary Sustainable Business Models |
|---------------------|--------------------------------------|-----------------------------------|
| 96                  | 1,000,000–4,999,000                   | No primary business model. ‘Maximise material and energy efficiency’ |
| 76                  | 5,000,000–9,999,000                   | Even distribution between no primary business model. ‘Maximise material and energy efficiency’, ‘Develop scale-up solutions’, and ‘Adopt a stewardship role’. |
| 24                  | 10,000,000–19,999,000                 | No primary business model. ‘Maximise material and energy efficiency’ |
| 8                   | 20,000,000–49,999,000                 | No primary business model. ‘Adopt a stewardship role’ |

Table 7. The companies’ success measurements.

| Measurement of Success                                                                 | Distribution of Responses (%) |
|----------------------------------------------------------------------------------------|------------------------------|
| We measure success solely in financial terms (profit, turnover, etc.).                  | 21 companies (10 %)          |
| We measure success primarily in financial terms (profit, turnover, etc.). However, we also take into account social benefits (increased happiness, well-being, etc. of employees and customers), and/or the environmental benefits (e.g. climate change). | 165 companies (81%)         |
| We measure success primarily in social benefit terms (increased happiness, well-being, etc. of employees and customers), and/or the environmental benefits (e.g. climate change), and secondarily in financial terms (profit, turnover, etc.). | 18 companies (9%)            |
**Company A**'s main business is to produce and sell milk to a large milk distributor higher up in the value chain. There are 190 milk cows at the farm. The company is owned by two brothers with their families. Beside the two owners, there are six employees at the company. The company has historically experienced few possibilities to develop and change the business model. However, during the last decade, the owners/managers have prioritized their competence building through several leadership and management courses, and have now formulated a new vision for the company:

“Our vision is to be a well-functioning farm for animals and humans, a modern machine station with the customer in focus. As a company, we want to build a good reputation in our district”.

They have diversified their business model and activities in several directions; the have started a mechanical workshop and a custom hire service. In the workshop, farming companies and other companies can buy services as maintenance and repair of vehicles and farming machinery. In the custom hire service, the customer can buy services as harvesting and for applying fertilizer and pesticides, etc. Since last year, the company has diversified even more. The company has started to sell a minor part of their milk production directly to end consumers in their farm shop and in some of the larger groceries in the neighbouring city.

The owners have developed the sustainability focus of the company step by step (in accordance with research regarding sustainability-oriented innovation, Adams et al. 2016). They started their journey towards sustainability according to the archetype ‘maximise material and energy efficiency’ and it is still the dominating archetype. It also means that from a sustainability oriented innovation-perspective, they are focusing operational optimization (doing more with less).

However, the development of their sustainable business model is ongoing. A minor part of their business model fits the archetype ‘deliver functionality, rather than ownership’. Further, the managers have continuously developed their stewardship role over the last years (which could be seen in the vision of the company). The company’s sustainable business model is moving towards Organizational transformation (doing good by doing new things).

**Company B** is a dairy cooperative company owned by 28 small and medium-sized milk farms (between 30 and 500 milk cows on each firm). The dairy’s main business is production and selling of high quality cheese.

The dairy was founded 1930, when milk prices were low and it was hard for the producers to get paid well-enough. The farmers in one neighbourhood developed a new business model before the concept even consisted. They joined together in a cooperative association and started their own dairy, which produced and sold milk, cheese and other dairy products. The vicinity was important for the founders of the dairy and it is still important today. All the milk are produced on farms which are situated within 25 min travel time from the dairy. Most of the milk and cheese are sold in groceries in southern Sweden. A minor part is sold directly to end consumers at the dairy. The quality of their products, based on sustainability and vicinity, has made their brand well-known.

Last year the dairy had over 100 busloads with visitors, exceeding 23 000 visitors. The dairy has recently decided to use biofuel for heating of the premises. The surplus heat will be used for heating of the neighbouring municipality senior housing.

Since the dairy products create larger value for end customers than the products sold by large international processing companies, the dairy company can sell their products
at higher prices. Consequently, the farms owning the dairy have larger revenues than
other farms which deliver to the large international processing companies.

The business model of the company as such has not changed much since the
company was founded, but the development of society has renewed it. From the
start, the business model was based on economic necessity but also on the founding
farmers’ stewardship perspective. A business that was regarded as out of date has now
become both modern and sustainable. One of the owners says:

“We have been out of fashion for 70 years, but now we are modern and in the front again”.

Since sustainability became an important societal concept during the last decade, the
company focus even more on sustainability. The investment decision regarding the
biofuel heater, which will benefit both the company and the senior housing, is one
indication of the sustainability focus. Further, the company has changed its communica-
tion with customers and emphasize values as quality, vicinity and sustainability.

The founding and succeeding farmers have over time acted based on a ‘stewardship
perspective’. Due to the societal change, the dairy paradoxically matches the SBM
archetype ‘re-purpose the business for society/environment’. It also matches ‘substitute
with renewables and natural processes’.

From a sustainability oriented innovation-perspective, their company have covered all
three dimensions. Even though the dairy was founded in order to reach operational
optimization (doing more with less), the stewardship perspective with focus on vicinity
and sustainability in combination which societal change has led to organisational
transformation and system building.

Company C is a farm charcuterie, which also conducts breeding and production of pigs.
The company was founded in 1998 and produces high quality sausages and other meat
products. Fresh and process meat are sold in the farm shop, in other farms’ shops and in the
groceries in the city. The meat is coming from the farm or from sub-contractors, farms in the
neighbourhood. The company has long-term oral agreements with the sub-contractors,
based on trust and a handshake. The sausages are handcrafted by old methods and not with
any additives, except spices and herbs. The company has diversified its products and
activities continuously over the years. The company develops new sausage varieties and
other meat products. Some of the new products have been develop by the employees of
the company. The last years the owners have also started to provide courses in sausage
craftsmanship, food waste minimisation and nutrition. One goal with the courses is to
generate some revenue, but the main reason is to educate the customers. The company
has started a restaurant at the farm, where they serve lunch and arrange conferences. In
order to get closer to the end customers and to learn their needs and expectations, the
company opened a shop in the city close to the farm charcuterie in 2005.

An important part of the business model is to develop and nurture long-lasting
cooperation with customers, other companies, sub-contractors and neighbours. The
owner is also explicit regarding sustainability:

“Our company and our farm will stay where it is. Of course, we have to take good care of our
land, our employees, our neighbours and our animals. We also want to create win-win
relationships with customers, sub-contractors and other companies”.
The company matches three SBM archetypes: (i) Encourage sufficiency, (ii) Substitute with renewables and natural processes, and (iii) Adopt a stewardship role.

From the start, the company has been run by the owner with a clear and explicit stewardship perspective, where sustainability is a central theme. The owner stresses the importance of local and professional networks. The company was the first to apply this perspective when it started the business 20 years ago. Since then other companies have followed. From a sustainability oriented innovation-perspective the company is conducting system building through the emphasis of working in networks with a win-win focus.

**Company D** used to be a traditional farm, with 100 hectares of fields, meadows and pastures, producing milk and grain. The previous owner, and father of the current owners, changed to ecological milk production in the mid-1980ies in order to raise the low profitability of the farm. That was the starting point for a continuous and ongoing sustainable business model development. The next step was to invite school classes with fifth graders to come and have an experience of the farming activities. It developed to a team-building concept, where companies could bring their employees to the farm and solve intellectual and practical problems together.

The current owners, three siblings, improved the old farm buildings and built some additional buildings, which they used to develop the business model with a spa integrated with the small river, a restaurant, a conference centre, a hotel and a winery/vineyard. Today, they have 15,000 vines and the wine is sold to distributors and directly to end consumers at the restaurant. An important and explicit building block of their business model is to use and develop the resources of the farm; the small river, the buildings, the vegetables, and the wine etc. The owners claim that:

*‘by experience we know that every challenge we meet also leads to new opportunities’.*

The family was conducting a traditional farm business from the start. A desire to increase profitability and catch opportunities led to diversification and continuous business development. The sustainability aspect was based on partly an identification of the farm and land as a key asset from a business perspective, partly on a stewardship perspective. The company matches three SBM archetypes: (i) Deliver functionality, rather than ownership, (ii) Substitute with renewables and natural processes, (iii) Adopt a stewardship role.

From a sustainability oriented innovation-perspective, their company are on the organizational transformation-level (doing good by doing new things).

### 4.3 Integration of results from both the survey and the case studies within the combined framework of sustainability-oriented innovations (SOI) and different SBM archetypes

In this section we will integrate the findings from both the survey and the case studies within the combined framework of sustainability-oriented innovations (SOI) (Adams et al. 2016) and the eight different SBM archetypes (Bocken et al. 2014).

*Table 8* show the orientation of the sustainability innovation practices and processes taken by companies in the agri-food sector of Sweden.
The most common approach is what Adams et al. (2016) classify by operational optimization, that is maximise material and energy efficiency (doing more with less), that 22% of the studied companies mainly use. What however is promising is that 34% of the companies have ‘moved’ to focus on what Adams et al. (2015) classify is organisational transformation adapting the SMB archetypes; Deliver functionality, rather than ownership, Adopt a stewardship role and Encourage sufficiency. Even more promising is that 44% are focusing on system building: doing good by others applying the SBM archetypes; Create value from waste, Substitute with renewables and natural processes, Re-purpose the business for society/environment and Develop scale-up solutions.

The companies in the case study; the milk producer (A), the dairy cooperative company (B), the meat producer and farm charcuterie (C) and the vineyard/conference hotel (D) have all clear stewardship perspectives in their sustainable business models. The company A is still very much oriented towards cost effective production, which means that they focus on maximise material and energy efficiency, which corresponds with operational optimization. The companies B and C reach out to other companies in their sustainable business models, so they are engaged in system building. The dairy is working close together with the producing farms and have a tight network of distributing companies. The meat producer and farm charcuterie has from the start worked together with the surrounding companies with a network perspective based on trust and cooperation. The company D have raised the degree of sustainability by doing new things and reached organisational transformation.

5. Discussion and conclusions

Despite the difference among the food producers related to their SBMs, we can draw several general conclusions.

In an article by Bocken et al. (2013), the authors conducted workshops with groups of firms from the manufacturing sector (automotive, cleaning, furniture, agriculture, food and printing) and found common themes across the industries, which support our findings. In
their work, the first finding is ‘industries need for innovation to embed sustainability in the business by considering environmental and social value, which is not typically done because of an economic/customer focus in conventional businesses’ Bocken et al. (2013, p.488). In our study, we found that more than 80 % use financial return as their primary measure of success, and social and environment issues as their secondary measure.

Secondly, they found that ‘there are limited tools that can be used by companies to develop novel business models and forms of value across the stakeholder network. Innovation has been approached generally in an ad hoc, experimental manner, rather than using specific tools or a prescriptive process.’ An interpretation of our results, where many of the firms in the agricultural sector, do not match to any of the archetypes while others match to several archetypes, could be seen as a consequence of the lack of specific tools for industry to use.

Thirdly, Bocken et al. (2013, p.488), found that ‘innovations often target negative impacts of business, and seek to reduce waste. This appears distinct from seeking new opportunities for customer-orientated value creation.’ We also found support for this, when most companies in our study used the SBM ‘maximise material and energy efficiency’.

Finally, they also found that ‘innovations often involve development of new collaborations extending beyond the traditional company network, not uncommonly involving new actors from industry sectors not traditionally linked to the firm.’ In our case studies, we found that all the companies have developed new collaborations through for instance leasing and rental services, diversification and through stewardship.

The sustainability-oriented innovation (SOI) framework regard sustainability as a dynamic, unfolding process that is achieved over time (Adams et al. 2016). Our study has also shown that sustainability is a continuous process. In our study, the archetype ‘maximise material and energy efficiency’ is a common and important SBM archetype. The reason for this could be low profitability, which leads the production-oriented agri-firm to use the archetype ‘maximise material and energy efficiency’ in order to lower costs.

Another important SBM archetype in our study is ‘adopt a stewardship perspective’. We would argue that the frequent use of adopting the stewardship perspective is a consequence of the unique characteristics of the agri-food sector. As Cagliano et al. (2016) have shown there is a clear interdependency between food production and environmental, human and physical resources. Barth et al. (2017) have elaborated on this connection. The owners/managers regard themselves as stewards or custodians of the company, the property, and the environment, with a responsibility for individuals, animals and growing things. The company is often based on a farm, which have been owned by the ancestors before. The company is depending on the resources of the land and it is going to stay where it is. Relations to neighbours and other companies are also important and has to be maintained. Hence, the stewardship perspective is important when developing sustainable business models in the agri-food sector. Adams et al. (2016) also state development starts with intentional changes to the values of the organization. Further, they suggest that the development of sustainability-oriented innovation often starts as a response to regulation. From our cases, we have seen that agri-entrepreneurs who have adopted a ‘stewardship’ business model often are ahead of legislation and policy when they develop their SBM.
Barth et al. (2017) have suggested that when studying the development of sustainable business models, the building block ‘value intention’ should be added to previously developed building blocks of the conceptual business model framework: (i) value proposition, (ii) value creation and delivery and (iii) value capture (Osterwalder and Pigneur 2005; Richardsson 2008; Bocken et al. 2014). Sustainability-oriented research also underlies of the philosophy and values of the organization (Adams et al. 2016). Further, other research has also recognized the importance of the cognitive aspects. Cagliano et al. (2016) and Walker (2012, 2014) have pointed on the conscience of the agri-entrepreneur as a value-based driver for SBM.

One limitation of the study is that we tried to sort the agricultural entrepreneurs SBM in eight predefined archetypes (Bocken et al. 2014), which is always a risk with a deductive approach. We could also have had more items related to each archetype, but due to practical reasons (such as length of interview), this was not possible to do since the interview guide already was comprehensive.

6. Implications and future research

6.1 Implications

This study shows that 90 % of Swedish agri-food companies regard social and environmental issues as part of their goals, besides economic profit. The Swedish Ministry of the Environment presented as early as 2003 a vision for sustainable development that strongly recommends all policy decisions take into account the longer-term economic, social and environmental implications (Swedish Ministry of the Environment 2003). This is a vision that surely applies to food producers in Sweden.

There is a large body of literature and studies that demonstrates “that the world as a whole and individual nations have benefited enormously from productivity growth in agriculture, a substantial amount of which has been enabled by a technological change resulting from public and private investments in agricultural R&D (Alston 2010, p. 19). A key point in this remark, given the global challenges in food production, is that international cooperation in the agricultural industry has greatly increased since the Second World War. The OECD Workshop in 2016 focused on the development and importance of innovation in agriculture and food production (Summary Report 24–26 May 2016 OECD Conference Centre Paris, France).

Our study reveals that half of the Swedish food producers in our survey are committed in some way to the promotion of social and environmental sustainability. The result is in line with the OECD report regarding Innovation, Agricultural Productivity and Sustainability in Sweden (OECD 2018) where Sweden is identified as one of the earliest OECD countries to raise awareness of environmental issues and develop environmental policies. The result has been that agricultural production in Sweden has remained stable, while the environmental pressures from the production has decreased. Considering the global needs and challenges, it is important to further develop the international cooperation regarding the development of sustainable business models in the agri-food sector. It seems likely that Sweden, as a frontrunner among food producers in the world, can contribute in this strive towards a sustainable (economic, social and environmental) agri-food sector.
6.2 Future research

Because the concept of the SBM in the agri-food industry is not well developed and empirical evidence on the use of the SBM in the agri-food industry is scarce, we recommend the following research topics and approaches.

Future research might examine how food producers (in Sweden and elsewhere) innovate their SBMs when they introduce new products and engage in new business activities. It would also be relevant to further deepen the understanding of the connection with the special challenges in the agri-food sector (Cagliano et al. 2016), the importance of the value-intention (Barth et al. 2017) and value-based drivers for sustainable innovation (Walker 2012, 2014). The case study approach is well-suited for such studies.

Another relevant question to investigate further is to compare the orientation of the SBM concept between industries. ‘Literature indicates that a wide range of traditional SMEs are still mostly focused on harvesting low hanging fruits by engaging primarily in incremental innovation’ (Klewitz and Hansen 2014, p.71). Our results from the agri-food sector in Sweden, shows that there are companies in the agri-food sector that optimize their operation with doing more with less, but the majority states that they focus on organizational transformation or even system building. Further, many of the owners/managers of the agri-food companies adapt a stewardship perspective. Hence, many companies in other industries, not at least SME’s, can get inspiration and learn from the agri-food sector.

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## Appendix

| Sustainable Business Model Archetypes | Statements about value: how value is defined, delivered and captured |
|--------------------------------------|-------------------------------------------------------------------|
| 1. Maximise material and energy efficiency | 1a. We conserve resources in order to reduce emissions, pollution, and waste.  
1b. We work to streamline the value chain (production and transport) by using fewer resources and reducing emissions, pollution and waste.  
1c. We work with optimum material usage and reduced waste and emissions as a way to reduce costs. |
| 2. Create value from waste | 2a. We recycle waste.  
2b. We actively work with our partners to recycle waste.  
2c. We work to reduce costs by reusing materials and taking advantage of spillage and waste. |
| 3. Substitute with renewables and natural processes | 3a. We work to reduce the environmental impact by using renewable energy sources or natural processes.  
3b. We develop our company by using renewable energy sources or natural processes to reduce waste.  
3c. We use renewable energy and reduce the use of non-renewable resources to increase our financial return. |
| 4. Deliver functionality, rather than ownership | 4a. Our services meet user needs without their ownership of the physical product (e.g. leasing of equipment).  
4b. Our business focus requires us to maintain close contact with our partners and on-going dialogues with our customers.  
4c. Customers pay for services and do not take ownership of the products. |
| 5. Adopt a stewardship role | 5a. We actively work to ensure the long-term health and well-being (environmentally and socially) of employees.  
5b. We ensure that our activities and our partners (third party certified) are focused on health and well-being (both environmental and social).  
5c. To actively ensure the long-term health and well-being (in both environmental and social terms), we work to strengthen our brand, which allows us to increase our prices. |
| 6. Encourage sufficiency | 6a. We work to influence customers to reduce consumption by offering sustainable products and services.  
6b. We and our partners focus on recycling.  
6c. We help to increase demand by educating and informing the public about our sustainable products. |
| 7. Re-purpose the business for society/environment | 7a. We operate a business that contributes to a low environmental impact as a member of the sustainable society.  
7b. We focus on creating social and environmental benefits through non-traditional relationships (e.g. employee ownership of the company).  
7c. We focus on delivering social and environmental benefits rather than economic profit maximisation by close cooperation with the community. |
| 8. Develop scale-up solutions | 8a. We work to develop and disseminate sustainable solutions to maximise benefits for society and the environment.  
8b. We work with partners who can develop and deliver sustainable solutions.  
8c. We use franchising or licensing to scale up our business. |