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FACULTY OF LANDSCAPE ARCHITECTURE, HORTICULTURE
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Change for sustainable agricultural business

Addressing business model transformation and
sustainable value creation

VERA SADOVSKA



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Vera Sadovska

Faculty of Landscape Architecture, Horticulture and Crop
Production Sciences

Department of People and Society

Alnarp



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© 2023 Vera Sadovska, <https://orcid.org/0000-0002-5215-5341>

Swedish University of Agricultural Sciences, Department of Department of People and Society, Alnarp, Sweden

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Change for sustainable agricultural business

Abstract

Society is facing global challenges, such as poverty and climate change, that affect entire ecosystems and human communities. Many sustainability challenges arise from existing production and consumption patterns, and thus many believe that business transformation to sustainability is essential to solving global socio-ecological problems. Understanding how sustainable business models are configured, and why companies adopt them, can be a pathway to system transformation. However, because of the complexity of sustainability challenges, they resist simple solutions and require innovative approaches. This thesis explored the potential for transformation to sustainability from the viewpoint of business model transformation in agri-food businesses, to understand why and how transformation happens, and how it can be facilitated at systems level. The focus on businesses in the agri-food sector was chosen to improve understanding of sustainable value creation in the agricultural and food production sector by transformation of business models to include sustainability.

Creation of sustainable value through transformation of agricultural business models for sustainability, which act as a unifying structure for policy implementation by integrating the strategic, procedural and operational activities of a business, was analysed. The results revealed managerial, organisational and inter-organisational processes related to this transformation, which were further conceptualised. Examination of the concept of value in the agri-food sector and the business models of agri-food companies revealed a multiplicity of value creation activities, a range of motives for sustainable business model transformation and interconnectivity between companies and their surrounding environment.

Overall, the results showed that sustainability can be placed at the core of an organisation. A novel contribution to the conceptual domain was creation of a new framework for sustainable value creation in the agri-food sector. This framework emphasises the need for simultaneous and equal integration of economic, social and environmental principles of sustainable development in value creation logic. It builds on the open character of sustainable business models and recognises the

importance of inter-organisational interactions to navigate transformation to sustainability. In particular, the framework promotes a more contextualised perspective on business model research, paying particular attention to multi-stakeholder interactions, learning, leadership and individual beliefs of key decision-makers.

Keywords: business models, sustainability transitions, sustainable value, agriculture, SME, farms, innovations, context, Sweden, agri-food.

Förändring för hållbart lantbruk

Sammanfattning

Syftet med denna avhandling var att utforska förändring för hållbart lantbruk med utgångspunkt från affärsmodellomvandling för att förstå varför och hur denna förändring sker och vad som kan göras för att underlätta den på systemnivå.

Samhället står inför globala utmaningar som fattigdom och klimatförändringar. Samtidigt växer den globala ekonomin och med det följer en ökad förbrukning av naturens resurser och mer avfall, vilket påverkar hela ekosystem och samhällen. Många hållbarhetsutmaningar har sin grund i dagens produktions- och konsumtionsmönster. Komplexiteten i dessa utmaningar innebär att det är svårt att hitta enkla lösningar, vilket talar för ett behov av innovativa tillvägagångssätt. Detta har lett till att forskningen uppmärksammat frågan om företagets roll i en hållbar utveckling. Denna avhandling motiveras av idén att affärsomvandling för hållbar utveckling är avgörande för att lösa globala socio-ekologiska problem och att lantbruket är en viktig del i denna diskussion. En förståelse för hur hållbara affärsmodeller är konfigurerade och varför företag använder dem kan vara en väg framåt mot en hållbar samhällsförändring.

Denna avhandling utforskar skapandet av hållbart värde genom omvandling av affärsmodeller för hållbarhet. Affärsmodeller representerar en för företaget förenande struktur för genomförande av sin strategi som integrerar ett företags strategiska, processuella och operativa aktiviteter. Avhandlingen belyser och conceptualiserar lednings-, organisatoriska och mellanorganisatoriska processer relaterade till denna transformation. Med fokus på företag inom lantbruks- och livsmedelssektorn syftar det till att bidra till förståelsen för hur hållbart värde skapas genom omvandling av affärsmodeller för hållbar utveckling.

Genom utforskandet av värdebegreppet inom lantbruks- och livsmedelssektorn och analys av affärsmodeller inom denna sektor, visar denna avhandling på mångfalden av värdeskapande aktiviteter, företagens motiv och drivkrafter för hållbar affärsmodellomvandling och sammankopplingen mellan företag och extern miljö där de verkar. Avhandlingens främsta bidrag är utvecklingen av ett nytt ramverk för hållbart värdeskapande inom lantbruks- och livsmedelssektorn. Denna

konceptuella modell betonar behovet av att integrera ekonomiska, sociala och miljömässiga principer för hållbar utveckling i värdeskapande logik. Avhandlingen bekräftar den öppna karaktären hos hållbara affärsmodeller och understryker vikten av mellanorganisatoriska interaktioner för att leda transformationer för hållbarhet. Vidare föreslås ett mer kontextualiserat perspektiv i forskning om affärsmodeller med särskild uppmärksamhet på interaktioner med flera intressenter, lärande, ledarskap och individuella övertygelser hos viktiga beslutsfattare.

Nyckelord: affärsmodeller, hållbarhetsövergångar, hållbart värde, jordbruk, småföretag, gårdar, innovationer, sammanhang, Sverige, jordbruks- och livsmedelssektorn.

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List of publications

This thesis is based on the work contained in the following papers, referred to by Roman numerals in the text:

- I. Sadovska, V., Ekelund Axelson, L. & Mark-Herbert, C. (2020). Reviewing value creation in agriculture—a conceptual analysis and a new framework. *Sustainability* 12(12), 5021.
- II. Sadovska, V., Fernqvist, F. & Barth, H. We do it our way – small-scale farms in business model transformation for sustainability (manuscript submitted to the *Journal of Rural Development*).
- III. Fernqvist, F., Sadovska, V. & Langendahl, P.A. (2022). Sustainable value creation—a farm case on business model innovation. *International Food and Agribusiness Management Review* 25(4), 543-554.
- IV. Sadovska, V., Rastorgueva, N., Migliorini, P. & Melin, M. Engagement of stakeholders in action-oriented education for sustainability: A study of motivations and benefits and development of a process model (manuscript submitted to the *Journal of Agricultural Education and Extension*).

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The contribution of Vera Sadovska to the papers included in this thesis was as follows:

- I. I am the main author. I took responsibility for conceptualization, data collection and synthesis. I share responsibility for writing.
- II. I am the main author. I am responsible for framing and writing most parts of the manuscript. I share responsibility for data collection and analysis.
- III. I am the second author. I share responsibility for data collection and analysis. I participated in framing and writing the manuscript.
- IV. I am the main author. I am responsible for conceptualizing and framing the article and for writing most of the manuscript. I share responsibility for data collection and analysis.

Other Publications

Articles

Barrios Latorre, S.A., Sadovska, V. & Chongtham, I.R. (2023). Perspectives on agroecological transition: The case of Guachetá municipality, Colombia. *Agroecology and Sustainable Food Systems* 47(3), 382-412.

Reports and factsheets

Fernqvist, F., Karlsson, O. & Sadovska, V. (2018). *Mervärden som konkurrensmedel– affärsmodeller och kompetenser för framgångsrika mervärdesstrategier*. Rapport 2018:23, (<https://www.slu.se/ew-nyheter/2018/6/mervarden-som-konkurrensmedel/>), Jordbruksverket.

Sadovska, V., Mark-Herbert, C., Ferguson, R. & Ekelund Axelson, L. (2019). *Marknadsföra Mer(-)värden*. LTV-fakultetens faktablad 2019:9, <https://pub.epsilon.slu.se/16143/>.

Sadovska, V. (2022). Practice Abstract #95: *Challenges with talent acquisition expressed by farmers*. Nextfood project. <https://www.nextfood-project.eu/>.his thesis is based on the work contained in the following papers, referred to by Roman numerals in the text:

Conference papers

Hunter, E., Sadovska, V., Mark-Herbert, C. & Berg, E. (2017). From fear of failure to fear and failure. Towards extending our understanding of fear and entrepreneurial behaviour. Relevance in *Entrepreneurship Research conference* (RENT XXXI), Lund, Sweden. 15-17 November, 2017. ISSN number 2219-5572.

Sadovska, V. (2018). Sustainable value creation in the agricultural sector. A literature review. *30th International Conference of Agricultural Economists (ICAE 2018)*, Vancouver, British Columbia, Canada. July 28-August 2, 2018.

Karantininis, K. & Sadovska, V. (2019). Constraints and enabling factors for engaging youth and women into agri-food in Africa: The role of innovations in youth entrepreneurship. *Agricultural Research for Development Conference (Agri4D 2019)*, Uppsala, Sweden. 25-26 September 2019.

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1. Introduction

Business transformation to sustainability is essential in solving global socio-ecological problems, and agriculture is at the core of this transformation. An understanding of how sustainable business models are configured and why companies adopt them can provide a solution for system transformation. Achieving such transformation among agricultural businesses is important due to their enormous impact on society and the environment. This chapter begins by describing the main sustainability challenges facing mankind and the potential role of business and business models as an instrument of transformation for sustainability (section 1.1). It then presents the research objectives and research questions addressed in Papers I-IV in this thesis (section 1.2) and the scope (section 1.3), followed by a short introduction of agri-food systems as a context for the research (section 1.4).

1.1 Background

Sustainable development involves achieving social well-being, such as advances in wealth, accessibility of healthcare and education, through sustainable use of planetary resources (Brundtland et al., 1987). At the same time, society is facing global challenges such as poverty and climate change, which are complex and uncertain problems affecting life-supporting ecosystems and human societies (Eisenhardt et al., 2016). The decrease in ecosystem quality occurring worldwide threatens the very existence of human civilisation (Sachs et al., 2019). Because of the complexity of these global challenges they resist typical solutions, thus requiring innovative approaches (Ferraro et al., 2015).

Many sustainability challenges arise from existing production and consumption patterns (van Kleef & Roome, 2007). Thus researchers have

begun turning their attention to the question of how businesses can contribute to sustainability (Engwall et al., 2021; Foss & Saebi, 2017). If the goal is to achieve profound system-wide changes, this will require significant shifts in business purpose and processes (Bocken et al., 2014). Businesses must then develop innovative approaches and reinforce sustainable development that targets different levels and scales (Baumgartner & Korhonen, 2010; Chesbrough, 2006; Dyllick & Muff, 2016). At the same time, considering the current level of biosphere destruction, it is clear that existing theories are not leading to a desirable state of sustainability. The pathway to a sustainable future can only be created with a clear theoretical and operational understanding of sustainability and systematic actions based on this understanding (Broman & Robèrt, 2017). This calls for comprehensive approaches to sustainability transition of society that integrate ecological, social and economic dimensions in equal measure.

Current business models have been identified as a key bottleneck in the change to sustainable business (Bidmon & Knab, 2018; Engwall et al., 2021). Since the primary logic of conventional business models is superior financial performance, with a value proposition for commercial customers and value capture in the form of profit (Teece, 2010), businesses tend to become locked into entrenched patterns and avoid sustainable alternatives (Bidmon & Knab, 2018).

Some emerging business models reflect pioneering efforts to rethink the dominance of the profit-maximising logic (Laasch, 2018), but a clear understanding of the principles of sustainable business models and how they operate and create value is lacking. Moreover, knowledge on the adoption of sustainable business models and how this can promote progress toward sustainable development is still limited (Dyllick & Muff, 2016; Engwall et al., 2021). There is no consensus among practitioners and researchers on what sustainable business models comprise (Rauter et al., 2017) and, due to the conventional focus on short-term financial success, there is a lack of concrete goals for sustainable business (Dyllick & Muff, 2016).

Adoption of sustainable business models has the potential to resolve current sustainability issues (Ortuño & Dentchev, 2021). Transforming from conventional business towards sustainable business is a challenging process (Long et al., 2017) that requires collective efforts, strong change capabilities and a multi-stakeholder vision (Köhler et al., 2019). Business can be regarded as responsible for many societal and environmental problems but,

with appropriate efforts and actions, it can also bring solutions. Transformation of business models and creation of new sustainable value are essential first steps in progressing towards sustainable business.

Any business that exists in a systems setting is connected to external stakeholders, the environment and society, and is thus subjected to regulations and affected by consumer demands. Conventional business model research applies an organisational lens, limiting the scope of its investigation to a company with some extensions to stakeholders that affect this company directly. The context of sustainability reaches beyond organisational boundaries to consider the entire system, which requires a socio-ecological perspective.

Socio-ecological systems consist of interdependent relationships between their participants and ensure the long-term functionality of human activities (e.g. businesses) and ecosystems (Francis & Bekera, 2014). The business model can be viewed as a boundary-spanning activity system that encompasses stakeholders outside the company (Amit & Zott, 2015). Thus information is needed on the environment around the company and on the multi-stakeholder interactions that create transformation in business models.

1.2 Research objectives and questions

This thesis explored creation of sustainable value through transformation of business models for sustainability. Business models represent a unifying structure for strategy implementation (Casadesus-Masanell & Zhu, 2013) that integrates the strategic, procedural and operational activities of a business (Rauter et al., 2017). The managerial, organisational and inter-organisational processes related to model transformation were analysed and conceptualised in this thesis, in order to improve understanding of how sustainable value is created by transformation of business models for sustainability.

Research context

Transitioning to sustainable business is especially important for resource-intensive areas, where the creation of economic value often leads to the destruction of value for other actors in present and future time (Hawken et al., 2013). Agri-food systems, including primary production, storage,

processing, distribution, marketing and consumption of food, play a prominent role in the sustainable development narrative due to their strong environmental, social and economic impacts (Testa et al., 2022). A better understanding of businesses in agri-food systems could thus contribute to greater sustainability of these systems.

Agriculture has an enormous impact on the planet. Agricultural land occupies around 40% of the Earth's habitable land area (FAO, 2021, p. 35), and the global food system is responsible for up to 37% of annual emissions of climate-affecting gases (Lynch et al., 2021, p. 2). Agriculture is also a source of contamination and degradation of ecosystems (IPCC, 2019) and contributes to water shortages globally (FAO, 2021). The unsustainability of current agri-food systems is highlighted by data in the Food and Agriculture Organisation's (FAO) 2021 Statistical Yearbook showing that 770 million people were undernourished in 2020 (160 million more in 2014), while at the same time obesity had increased in all regions, with 30% of adults reported to be obese in Northern America, Europe and Oceania (FAO, 2021, p. 26). Current agricultural and food production relies on finite resources, utilised at the expense of ecosystems (IPCC, 2019). The demand for resources in agricultural production is growing, while the supply of resources (land, water, minerals) is dwindling (Garnett, 2014). Social issues of hunger, malnutrition, food insecurity and food waste arise from or surround agriculture (El Bilali, 2020). The economic and labour conditions of many small farmers need improvement (Testa et al., 2022). Actions by all stakeholders, including businesses, are needed for social and technological change in agri-food systems (Köhler et al., 2019).

The problems with the current agri-food system create an urgent need for transformation towards sustainable alternatives. A more sustainable system would involve a synergy between human needs for food and a thriving planet Earth (DeLonge et al., 2016; Melchior & Newig, 2021). Such change would involve numerous stakeholders with different resources, driven by different motives. Businesses in the agri-food sector are currently saddled with responsibilities to comply with public expectations of being responsible, while at the same time needing to reconcile conflicting goals (Testa et al., 2022). The transformation that businesses will have to undergo concerns "intentional changes to an organization's philosophy and values, as well as to its products, processes or practices to serve the specific purpose of creating and realizing social and environmental value in addition to economic

returns.” (Adams et al., 2018, p. 180). Changes will need to take place at operational, organisational and technological level, and also at institutional and societal level (Testa et al., 2022).

The initial approach to change in agri-food systems in terms of technological innovations to reduce environmental impact focused on improved decision-making on agricultural processes (De Luca et al., 2018; Long et al., 2017). Recently, the focus was extended to include social innovations associated with the creation of social value (Nazzaro et al., 2020) and the opinions of a wide range of stakeholders (Pancino et al., 2019). The global and regional mega-trends in agri-food systems that affect, and are affected by, businesses are described in detail in Chapter 4 of this thesis.

Research questions

Agricultural businesses were used as the case in this thesis to investigate how agri-food systems can be changed for sustainability through the creation of sustainable value and transformation of business models. The underlying assumption was that creation of sustainable value has the potential to contribute to sustainable agriculture, while at the same time allowing agri-food businesses to be competitive now and in the future. To address the main aim of the work, the following research questions (RQs) were formulated:

RQ1: What are the principles of sustainable value creation for agricultural business?

RQ2: How can business models be transformed to create sustainable value in agricultural companies?

RQ3: How can multi-stakeholder collaboration contribute to the sustainability of agricultural companies?

These research questions were addressed in Papers I-IV, as summarised in section 1.4.

1.3 Research positioning and scope

Research questions RQ1-RQ3 positioned the work within the wide research field of business administration and the theoretical sub-discipline of sustainable business model research (Table 1). The phenomena of value creation and business model transformation were investigated particularly in relation to sustainable business. Similarly, the investigation of multi-stakeholder collaborations focused on the case of sustainable business. Various empirical materials from the agri-food sector in several European countries were used for these investigations, focusing on the sustainability perspective in business model and value creation for a focal company and its interactions with industry and a network of stakeholders.

Table 1. Position of the work in this thesis within the wider research landscape

Discipline	Sub-discipline	Topics	Context
Business administration	Sustainable business models	Value creation. Business model transformation. Multi-stakeholder collaboration.	Agri-food systems

Agri-food systems are multi-level and multi-stakeholder constructs that require a structural approach to change. The transition to more sustainable agri-food systems can be viewed in terms of large-scale sustainable transformation to sustainability (Lamine et al., 2019). Individual companies with their sustainability strategies expressed in business models are important elements in this transformation (Bolton & Hannon, 2016). For-profit companies in the agri-food sector were analysed in this work, to investigate their actions towards sustainable business and assess how this relates to the overall system transition to sustainability.

The perspectives for studying business models can be categorised into product, business unit, company and industry (Wirtz et al., 2016). Alignment between company and industry level allows a systems perspective to be applied (Suskewicz, 2009). The company-industry level of analysis, which fits the sustainability perspective, was applied in Papers I-IV in this thesis. The addition of sustainability to the business model topic opens boundaries beyond the single organisation (Dentchev et al., 2018). Therefore, although the emphasis of the present work was on agri-food businesses, it was not

limited to company boundaries and interactions with the surrounding stakeholders were studied, to introduce a system-level view. In relation to sustainable transformation, a system-level view rather than a product focus has greater potential for environmental and social benefits (Schaltegger et al., 2016).

1.4 Overview of Papers I-IV

The research questions were addressed in the work described in Papers I-IV, as summarised below. Table 2 states the objective/s of each paper and the research question(s) considered.

Table 2. Research questions and objective/s of Papers I-IV

Paper and title	Research question/s	Purpose
I. Reviewing value creation in agriculture — a conceptual analysis and a new framework	What are the principles of sustainable value creation for agricultural business?	<ul style="list-style-type: none"> • Review the literature on the concept of value creation in agriculture • Identify value creation topics in the field • Suggest a new framework for sustainable value creation in the agricultural sector
II. We do it our way – small-scale farms in business model transformation for sustainability	<p>What are the principles of sustainable value creation for agricultural business?</p> <p>How can business models be transformed to create sustainable value in agricultural companies?</p>	<ul style="list-style-type: none"> • Understand business model transformation for sustainability by identifying drivers and barriers to change • Map changes in practices in business model segments • Analyse created sustainable value using a new framework for sustainable value creation in the agri-food sector
III. Sustainable value creation - a farm case	How can business models be transformed to create	<ul style="list-style-type: none"> • Practically contribute to the development of education

Paper and title	Research question/s	Purpose
on business model innovation	sustainable value in agricultural companies?	<ul style="list-style-type: none"> Analyse knowledge and competencies for business model transformation
IV. Engagement of stakeholders in action-oriented education for sustainability: A study of motives and benefits and development of a process model	How can multi-stakeholder collaboration contribute to the sustainability of agricultural companies?	<ul style="list-style-type: none"> Understand the transition to sustainable education through multi-stakeholder learning Identify motivations and benefits of stakeholder engagement in education Develop a process model of stakeholder engagement

Paper I: *Reviewing value creation in agriculture—a conceptual analysis and a new framework*

In Paper I, the current understanding of the value in agriculture was systematically reviewed and a new framework for sustainable value creation to establish a vision for sustainable agri-food systems was developed to drive future creation of sustainable value. The systematic literature review, of 108 scientific publications, consolidated value creation topics into nine clusters: collaboration, communication, knowledge, production, diversification, entrepreneurship, funding, policies and inclusiveness. Assessments from the perspective of environmental, social and financial dimensions of sustainability revealed that the current understanding of value in agriculture is conceptualised in the near-term perspective with an emphasis on financial gains.

Paper II: *We do it our way – small-scale farms in business model transformation for sustainability*

The vision of sustainability in agricultural business was developed in Paper II by exploring three farms as examples of frontrunners in sustainable value creation. The specific focus was on factors of change and change activities in the business models of these companies. By applying the framework developed in Paper I, sustainable value created as the result of these changes was identified. Building on the empirical evidence obtained for the three case

farms, the framework for sustainable value creation was revised by addition of topics identified as being potentially important for current and future sustainable value creation.

Paper III: Sustainable value creation - a farm case on business model innovation

In Paper III a teaching case was developed as a practical outcome of the research results in Papers I and II. This teaching case focuses on a small cattle farm in Sweden and offers students an opportunity to study management of business model innovation in this context. The case explores the value creation strategy of the cattle farm and applies activities such as mapping a business model, developing suggestions for business model innovation, analysing existing and lacking managerial competences, and highlighting implications for agricultural policy. As a result, profitability, competitiveness and sustainability of the case farm should be achieved, together with acquisition of knowledge and skills by the farm owner. This teaching case is suitable for agricultural students of different levels seeking knowledge of business and management.

Paper IV: Engagement of stakeholders in action-oriented education for sustainability: A study of motivations and benefits and development of a process model

The specific focus in Paper IV was on knowledge and learning in multi-stakeholder collaborations, which were identified as important for sustainable value creation. A multi-stakeholder approach must thus be an integral part of sustainable development. Paper IV explored the motivations and benefits to agricultural businesses of engaging in collaborative relationships with universities for the purposes of knowledge exchange and mutual learning. Building on the empirical findings and a literature review, a process model for non-academic stakeholder engagement in collaborations for educational purposes was developed.

1.5 Target audience

The target audience for the research conducted in this thesis was primarily the academic community, including researchers working with business models, sustainable value, transition to sustainability, pedagogics researchers and of course scientists focusing on agri-food systems and their transition to sustainability. However, due to the practical character of the agricultural sciences field, the findings were also intended to be relevant for business practitioners and active educators. For example, the framework for sustainable value creation developed in Paper I can be used to map the sustainability of an agri-food business and provide advice on the areas of future development. The process model for stakeholder engagement developed in Paper IV can be used by educators to initiate and lead collaborations between a university and non-academic stakeholders for teaching purposes.

1.6 Structure of the thesis

This introductory chapter summarised the main sustainability challenges facing mankind and the potential role of business and business models in transformation for sustainability, and summarised the research questions reported in Papers I-IV.

The remainder of the thesis is structured as follows: The relevant scientific literature is summarised in Chapter 2 and the research design applied in Papers I-IV is presented in Chapter 3. Chapter 4 describes the research context of the agri-food sector, while Chapter 5 provides details of the findings in Papers I-IV and the contributions to the research field. Chapter 6 discusses the findings in relation to the wider field of research and presents theoretical contributions of this thesis. Conclusions from the work, managerial implication and suggestions for future research are provided in Chapter 7.

2. Theoretical framework

The underlying theories that formed the background to the research are presented in this chapter. Section 2.1 examines the fundamental connection between business and sustainability. Section 2.2 reviews the literature on business models, while section 2.3 describes change processes and business model transformation. Section 2.4 summarises the literature on business models for sustainability and sustainable value creation. Research gaps identified in the literature are listed in section 2.5, while section 2.6 presents the conceptual framework and motivation for the work in this thesis.

2.1 Sustainability and business

Sustainable development presupposes the integration of social and environmental concerns into economic decisions (Brundtland et al., 1987). However, achievement of a sustainable economy will require significant transformation in the purpose of business (Bocken et al., 2014). Research on sustainability in business studies has developed rapidly since the 1990s (Zemigala, 2022). It mainly concerns topics such as supply chain (Khan et al., 2021), environmental management (Dey et al., 2018), and corporate social responsibility (Latapí Agudelo et al., 2019). Corporate sustainability (Meuer et al., 2020), sustainable business (Dyllick & Muff, 2016) and business sustainability (Chopra et al., 2021) are recent developments that reflect a business-centred view on sustainable development and look at ways to translate the macro-level notion of sustainable development to the level of business (Baumgartner & Ebner, 2010). The existing framework for strategic sustainable development suggests back-casting from boundary conditions to achieve full transformation to social and environmental sustainability (Broman & Robèrt, 2017). It emphasises self-benefits of commitment to

sustainability and promotes cross-sector application of strategic steps to sustainable goals. Tested in the context of municipalities, this framework demonstrates support for cross-sector implementation of strategic sustainable development (Wälitalo et al., 2020).

The sustainable business view attempts to incorporate social and environmental concerns into business activities, including interactions with stakeholders (Dmytriiev et al., 2021; van Marrewijk & Werre, 2003). To embrace the importance of social issues, management theories have adopted the principles of stakeholder theory, which states that business activity should result in value created for all its stakeholders, i.e. all those affected by such activity (Freeman, 2010). In this view, a whole business is seen as a network of relationships among stakeholders and the interests of one group should not be prioritised over those of the other (Friedman & Miles, 2002). These principles have become the cornerstone of sustainable business and are complementary to other business sustainability frameworks (Dmytriiev et al., 2021).

Inside the business, sustainability is included in tactical, strategic and operational levels (Baumgartner & Korhonen, 2010; Breuer et al., 2018; Robèrt & Broman, 2017). The tactical level is expressed through a company's vision, mission and principles; the strategic level involves developing a sustainability strategy; and the operational level is its implementation in business activities. Business models represent a link between the strategic and operational levels (Rauter et al., 2017), and hence integration of sustainability into business models requires development and implementation of a corporate sustainability strategy. Business models incorporating strategic and operational levels are considered to be the cornerstone of change toward sustainability (Lovins et al., 1999).

In contrast to the conventional view in economics of companies as independent entities, sustainable development treats them as actors connected to other actors in economic and social systems, which requires the understanding of the value concept to be broadened (Stubbs & Cocklin, 2008). This calls for the adoption of both system- and company-level perspectives on value creation (Roome & Louche, 2016), which has direct implications for sustainable business models. Focusing on eco-efficiency (Heiskanen & Jalas, 2003), servitisation (Frank et al., 2019) and other types of product and service innovations is not sufficient, because they may have the 'rebound' effect of increased consumption due to affordability and

accessibility (Bocken et al., 2014). Adopting a system-level view on value creation allows companies to see the effects of their value proposition across socio-ecological systems. This requires dialogue between stakeholders to identify such effects and support changes in response to problems (Fineman & Clarke, 1996; Zott et al., 2011). Moreover, the sustainable perspective on value capture extends beyond the company itself into society (Schaltegger et al., 2016), leading to the emergence of new forms of collaboration. This often involves learning in new action-learning networks (Clarke & Roome, 1999), and demands new skills and competencies (van Kleef & Roome, 2007).

2.2 What is a business model?

In the 1990s, the managerial literature discussed the business model concept intensively (Demil & Lecocq, 2010). In broad terms, the literature on business models deals with how companies organise their activities to create and capture value. According to Teece (2010, p. 173), the business model “articulates the logic and provides data and other evidence that demonstrates how a business creates and delivers value to customers”. From the perspective of conventional strategic research, value creation is a supply-side phenomenon, i.e. value is sourced from competitive advantage and is created solely by producers of goods and services, while the business model view on value involves the supply and demand side, allowing for multiple sources of competitive advantage (Massa et al., 2017).

Looking deeper, the literature offers several interpretations of the business model concept, with some disagreement between scholars on its operational definition. The concept has been confused with other managerial terms such as strategy, economic or revenue model, and business concept (DaSilva & Trkman, 2014). The main distinction lies in the view that a business model provides a link between strategic and operational levels (Rauter et al., 2017) and stands behind value creation, delivery and value capture (Chesbrough, 2006; Teece, 2010). The value-centred approach helps achieve a clearer understanding of the business model and its applicability in various contexts (Morioka et al., 2018).

Another approach regards a network of activities as a property of a business model: “The business model is (...) the platform which connects resources, processes and the supply of a service which results in the fact that the company is profitable in the long term.” (Nielsen & Lund, 2014, p. 5).

Similarly, Baden-Fuller and Mangematin (2013) state that business models link internal processes of a firm to external elements, including the customer aspect. These definitions emphasise the connectivity of business operations and place interrelations at the core of value creation. This implies a need to identify a network of competitors and collaborators in order to exploit the potential of a business model.

Business models aim to find novel ways of creating, delivering and capturing value. These activities emerge from the core characteristics or building blocks of a business model. Based on the literature, the following building blocks are commonly specified: value proposition (refers to value embedded in product or service); value creation (refers to company activities, resources, partners, customers, technologies and distribution channels); value capture (refers to cost and revenue streams); value network (refers to the relationship with customers, suppliers and other actors); and the connections between the blocks (Bocken et al., 2014; Geissdoerfer et al., 2018; Morioka et al., 2018; Osterwalder & Pigneur, 2010).

In the literature on business models, two types of approaches can be seen. One is the static approach, which looks at the structure and the components of the business model. The other is the dynamic approach, which sees the business model as instrumental in transformational change (Demil & Lecocq, 2010). This dynamic approach was of particular interest for the present work, as it concerns business model transformation itself, transformation factors, motivation for transformation, and conceptualisation and implementation of transformed business models (Geissdoerfer et al., 2018).

2.3 Change processes and business model transformation

Reasonably, business change means shifting a company from an existing state to a future state, in accordance with some strategic vision (Greenwood & Hoyte, 2007). The research on change process focuses on unfolding phenomena taking into consideration the time dimension and the type of change processes (Langley et al., 2013). Business models are expected to contribute substantially to sustainable development, which by definition involves continual adaptation of business to social, economic and environmental conditions (Roome & Louche, 2016). Based on this

perspective, it is important to consider underlying practices, processes and outcomes of business models; to understand and conceptualise the dynamics of transformation through business models; and to examine the connection between business model transformation and sustainable development.

Despite growing numbers of publications relating to business models, it is still unclear how companies change and develop their business models in general (Achtenhagen et al., 2013) and to address sustainability in particular (Ferlito & Faraci, 2022). The literature to date mostly describes a stable model that is already implemented, rather than examining business model adaptation processes in different circumstances or exploring continuous business model change due to the changing circumstances associated with sustainable development. Some studies have examined the evolution and dynamism behind new business models (Achtenhagen et al., 2013; Demil & Lecocq, 2010), but this area remains under-researched.

The dynamic approach to the business model sees it as a change tool based on innovations, where the level of change correlates with the degree of innovation (Geissdoerfer et al., 2018; Schaltegger et al., 2012). For example, an incremental change in energy efficiency redefines the existing business model of a company so that it corresponds to the principles of sustainable development. This view is necessary to increase understanding of a change, but it overlooks the process aspect. Knowledge of how business models are created, changed and/or abandoned may help in building a systemic view on business model transformation and whether business models can substantially contribute to more radical change for sustainability.

Relating to business model change, four archetypes are suggested: a business model can be created if it did not exist before; a business model can be extended if a company complements its existing model with a new approach; a business model can be revised if a company replaces the old model with a new; and a business model can be terminated if a company abandons it (Cavalcante et al., 2011). This thesis focused on business model extension and revision, using the examples of companies that have adopted some aspects of sustainability into their businesses (complementation) and companies that have gone through transformational changes to bring together economic, environmental and social considerations (revision). Both processes of business model change are associated with risks and uncertainties, but revision is more fundamental and is likely to pose challenges such as lack of knowledge and skills (Cavalcante et al., 2011).

A business model needs to be continuously adapted to internal and context-related changes. Any degree of change is triggered by an event, problem or dilemma, which causes a search for solutions. According to business behaviour theory, this search for solutions starts when organisations fail to achieve their goals (Cyert & March, 1963). This view is valid, but not complete. The search for solutions in response to a particular problem is limited by existing experience and knowledge (Bresman, 2013), whereas aspirational change can stimulate a search for more fundamental solutions (Roome & Louche, 2016) as it is not limited to finding simple solutions. In addition, business models change through organisational learning (Achtenhagen et al., 2013), which can be classified into experimental, improvisational, vicarious and trial-and-error learning (Bingham & Davis, 2012; Srinivasan et al., 2007). Direct learning comes from inside the organisation, while indirect learning draws on experience from outside the organisation but both involve the four classes of learning (Roome & Louche, 2016).

Research in the field of business model development points to a number of capabilities as enablers for change. Among these are an orientation toward exploiting business opportunities; balanced use of resources; and consistency between management, culture and employee commitment (Achtenhagen et al., 2013). These capabilities are considered to be related to the sustainability of an organisation (D'Amato & Roome, 2009).

2.4 Business models for sustainability

Around a decade ago, business model scholars started to develop an interest in integrating organisational sustainability into the business model field (Stubbs & Cocklin, 2008). Within that body of work, some studies looked at how organisational structure and culture can affect organisational sustainability (Bocken et al., 2013; Stubbs & Cocklin, 2008), while others investigated ways for sustainable innovations to reach the market (Boons & Lüdeke-Freund, 2013; Schneider & Clauß, 2020). Later, research on sustainable business models became an integrative research field that is based upon, but goes beyond, established fields such as traditional business models and corporate sustainability (Lüdeke-Freund & Dembek, 2017). There has recently been a call for transdisciplinary research on sustainable business models, with suggestions that researchers should seek to understand

the context and be flexible in their focus in order to improve this research field (Ortuño & Dentchev, 2021). This means adding a sustainable perspective to business models, questions, definitions etc.

There have been many attempts to define what constitutes a sustainable business model (Boons & Lüdeke-Freund, 2013; Rauter et al., 2017; Schaltegger et al., 2012; Stubbs & Cocklin, 2008; Upward & Jones, 2016) and this field is still emerging. The business model concept does not have a unified definition and is not operationalised in practice (Bocken, 2021; Fobbe & Hilletoft, 2021). Some consistencies across all definitions are: a holistic view on organisation, a central role of value creation that includes social, environmental and economic dimensions when defining organisational purpose (Battilana & Dorado, 2010; Bocken et al., 2014; Schaltegger et al., 2016) and consideration of the needs of all stakeholders (Lüdeke-Freund et al., 2020; Stubbs & Cocklin, 2008). Other features are application of a triple bottom-line approach to measure performance, embracement of system- and company-level perspectives, and treatment of nature as a stakeholder to promote environmental stewardship (Pache & Santos, 2013; Stubbs & Cocklin, 2008; Tracey et al., 2011).

Overall, business models for sustainability embody creation of value for the company and for society (Roome & Louche, 2016). They incorporate three pillars of sustainability (economic, social and environmental), forming a triple bottom line (Elkington, 1998) to serve as an intrinsic component of the value logic of a company. In the same way, a sustainability agenda induces business to be innovative and creative (Stubbs & Cocklin, 2008), while business models for sustainable development inspire novel types of value to be created in new ways with a wider range of stakeholders.

A specific characteristic of sustainable business models is that they allow for collaborations beyond the company (e.g. with other companies, customers, suppliers), to innovate on networks and apply a systems perspective (as opposed to single-product innovation) (Ceschin & Gaziulusoy, 2016). Through this perspective, the traditional business model construct is extended to accommodate sustainability, so that: the value proposition provides measurable social and environmental benefits, in dialogue between business and society; value delivery includes responsible ways to supply value to customers along the chain; value capture looks at capturing and fairly distributing social and environmental costs and benefits among stakeholders; and the customer interface involves relations and

communication with customers to motivate them to practise responsible consumption (Boons & Lüdeke-Freund, 2013). However, a strong focus on sustainability aspects in a business model does not exclude the prerequisite for a business to be economically viable (Bocken et al., 2013). Sustainable business model transformation thus searches for solutions to capture economic value while not generating destruction, or ideally creating environmental and social benefits, which establishes the business case for sustainability (Schaltegger et al., 2012).

2.5 Identified gaps in research

There is scientific and public consensus on the need for business to become more sustainable. Business models have been shown to play a central role in the transition to sustainability (Lüdeke-Freund et al., 2020; Roome & Louche, 2016). Although scientific and practice-oriented studies on sustainable business models have proliferated in the past decade (Méndez-León et al., 2022), several research gaps still exist. Most studies do not offer insights into the multidimensional features of business models, or development of integrative theories of sustainable management, or an understanding of the current versus future effects of sustainable business model implementation (Geissdoerfer et al., 2018; Rauter et al., 2017). By bridging theories from sustainability sciences and management studies, the field of sustainable business models can be enriched. Figure 1 provides a schematic depiction of the research gaps addressed in this thesis and links them to Papers I-IV.

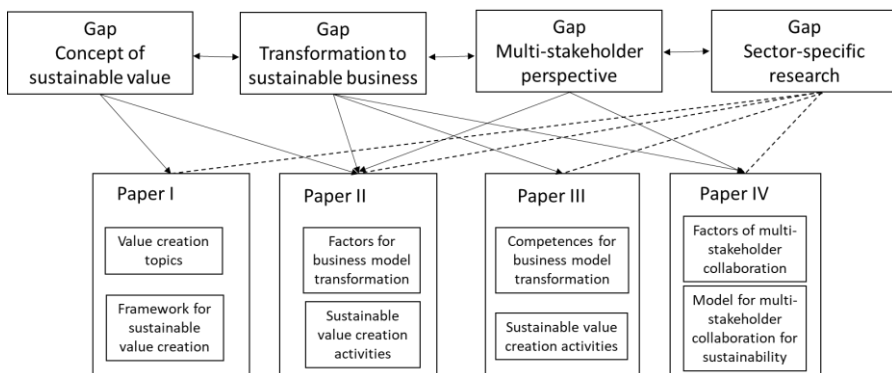


Figure 1. Research gaps and topics addressed in Papers I-IV.

Value creation is extensively discussed in strategic management and organisational literature (Bowman & Ambrosini, 2007; Lepak et al., 2007). The literature places value creation at the core of business model definitions and links these two concepts together (Geissdoerfer et al., 2018). Studies agree that business models are about how a business creates value (e.g. Teece, 2010a; Zott et al., 2011) and that the whole field of business model research obtains its legitimacy from the focus on value (Lüdeke-Freund et al., 2020). However, this key concept remains weakly understood and is only vaguely defined in business model research (Bocken, 2021; Fobbe & Hilletofth, 2021). There is thus a research gap about understanding the value creation concept, including the sustainability aspect, and its operationalisation in practice.

Businesses can contribute to sustainable development by rethinking business models (Bocken et al., 2014; Hart & Milstein, 2003; Lüdeke-Freund et al., 2020). While companies are interested in sustainability, full-scale transition to sustainable business models has not yet been achieved. More research is needed on enabling factors and barriers to the adoption of a sustainable perspective (Roome & Louche, 2016). Sector-specific investigations can assist in addressing business model design to prompt change (Bock et al., 2021). There is thus a research gap about understanding the transformation of business models and the enabling and preventing conditions for adoption of a sustainability perspective.

Most business model frameworks map the unidirectional flow of activities – between the company and its customers (Freudenreich et al., 2020). Such frameworks are dominated by company-level analysis of the business model concept (Pedersen et al., 2021) and ignore multilateral connections with other stakeholders (Méndez-León et al., 2022). However, a sustainability-oriented business model needs to take the business context into account and view the business as part of a system. It is not clear whether participation in business models influences the awareness and beliefs of all parties (Aagaard & Ritzén, 2020). Little research has focused on how to include a broad range of stakeholders when developing and applying a sustainable business model (Fiore et al., 2020). Existing research has not investigated multidirectional flow of value between a company and its stakeholders (Freudenreich et al., 2020). Theories on organisational learning and change can explain adoption by companies of sustainable business models, including partnerships and learning-action networks (Schaltegger et

al., 2016). There is thus a research gap about a multi-stakeholder view on business models and exploration of the role of multiple stakeholders in achieving a transition to sustainable business models is needed.

While conceptual analysis of sustainable value is a way to advance theoretical knowledge, there have been calls for more practical investigations. The current literature on sustainable business models remains mostly conceptual and does not provide insights into the processes of practical business model development and management (Roome & Louche, 2016). A broad understanding of sustainable value is achieved by pursuing diverse empirical pathways (Méndez-León et al., 2022). It has been shown that business models are context-dependent and display variations across markets and geographical conditions (Baden-Fuller & Mangematin, 2013; Hart & Milstein, 2003). In this regard, evidence on the contextual specifics where diverse value approaches are employed (Lüdeke-Freund & Dembek, 2017) can complement a holistic view on value. There is thus a research gap in terms of context-specific research (which was addressed in this thesis by studying companies in the agri-food sector).

2.6 A conceptual framework and motivation for the thesis

Recent studies on sustainable business models have started to form a separate research field where sustainable value creation plays an important role (Lüdeke-Freund et al., 2020; Lüdeke-Freund & Dembek, 2017). This field depends on the previously established disciplines, but it transforms the adopted knowledge.

Sustainable business models as an integrative field combine ideas from the fields of traditional business models, corporate sustainability and stakeholder theory. Corporate sustainability translates sustainable development principles into business. The business model links the company and the environment in which it operates. Stakeholder theory brings the multi-actor characteristic into the sustainable business model. However, each of these fields has a certain weakness when applied to sustainable business model development. The research on sustainable business models emerged as an attempt to overcome weaknesses of the existing business model literature in terms of lack of a sustainability perspective and integrated system approach. Apart from some attempts mentioned in previous sections, the business model field lacks an integrative sustainability perspective. The

corporate sustainability field lacks developed business value creation and capture perspectives. Therefore efforts were made in this thesis to strengthen the foundation for sustainable business models to become established as a new independent field of research with integrative knowledge deriving from other research areas and with its own original contributions. Figure 2 indicates the theoretical background to the work in this thesis and its conceptual positioning.

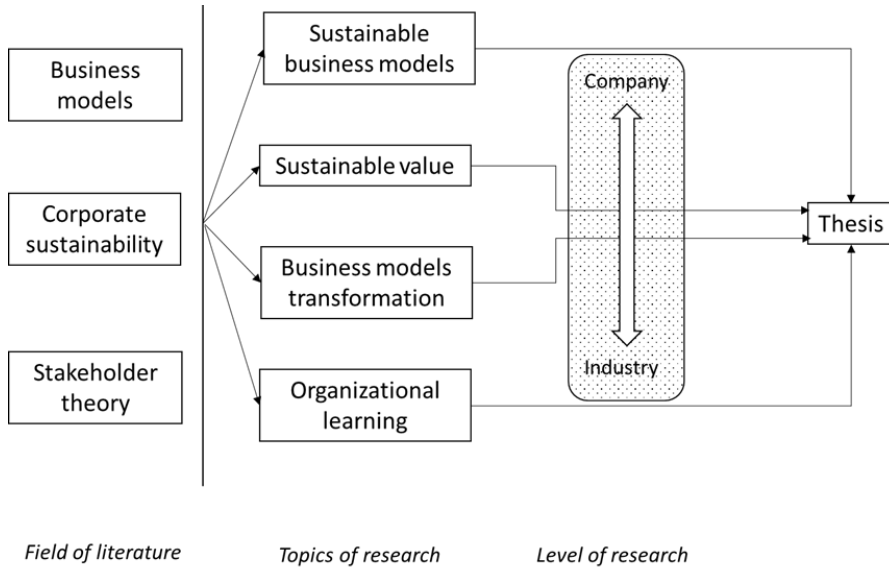


Figure 2. Theoretical background to the work in this thesis and its conceptual positioning.

The foundation for this thesis was traditional business model research and corporate sustainability and contemporary stakeholder theory. Four topics at the interface of these research fields were studied, namely: sustainable business models, sustainable value, business model transformation and organisational learning. The work was located in the alignment between company and industry level, to enable systems thinking.

3. Research approach and method

Scientific methods were employed in Papers I-IV to study social phenomena. As complex and varied concepts, social phenomena are not only interpreted, but also constructed, requiring researchers to deal with uncertainty and to cover ontological, epistemological and methodological aspects. Different methodological approaches were used in Papers I-IV, but the studies are bound together by similar perceptions of reality. This chapter describes the underlying ontology and epistemology (section 3.1), the research strategy (section 2.2) and the methodological approaches used (section 3.3). Section 3.4 discusses trustworthiness in research, section 3.5 describes the sequence of work in Papers I-IV and section 3.6 raises some ethical considerations. Section 3.7 provides reflections on research design choices and limitations of the work.

3.1 Ontological and epistemological perspectives

Paradigms underpin philosophical assumptions that form a scientific view on the world (Kuhn, 1962), and guide research-related choices from the stage of problem formulation and theoretical foundations to interpretation of findings. Paradigms are conceptualised as social constructs that reflect values of researchers and they cannot be compared to each other to establish which is offering more accurate view on reality (Arndt, 1985).

Following the research edifice concept (Gummesson, 2005), Figure 3 illustrates and brings together different research choices made in this thesis. The foundation for the research was ontological and epistemological perspectives. Data generation and analysis were represented by the research strategy and methodological approaches. The outcome level consisted of presentation of the results.

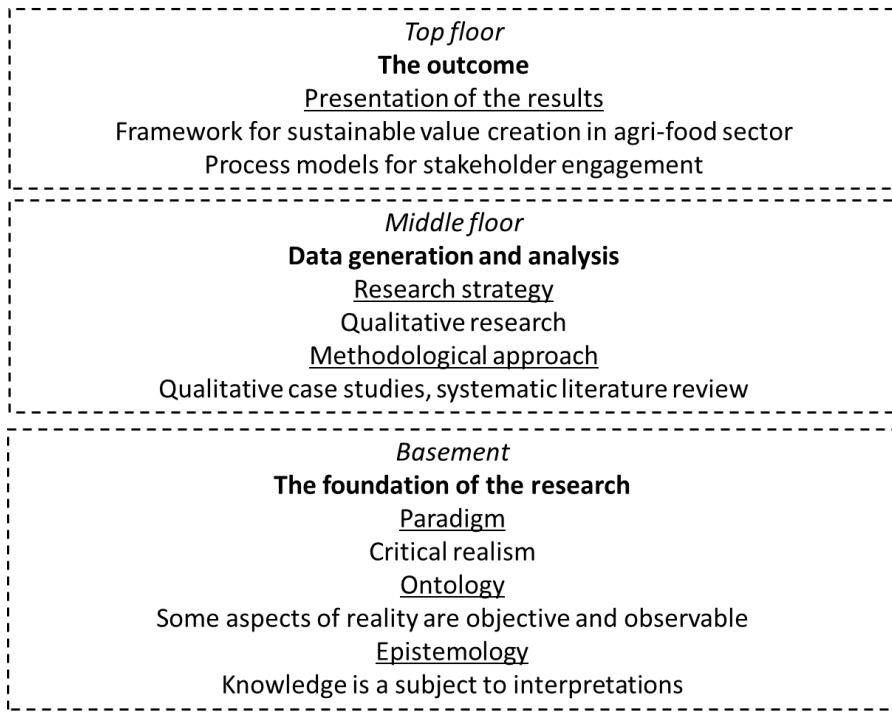


Figure 3. Research edifice (adapted from Gummesson, 2005, p. 313).

The dialogue about sustainability is inherently an interdisciplinary field dealing with real-world problems. It often intends to provide policy recommendations and decision-making support to stakeholders (Stock & Burton, 2011). The need to combine social aspects, often interpreted and constructed, with environmental aspects, often objective and factual, fits the critical realism paradigm, as it searches for causation and explanation of societal problems to provide guidance for decisions (Fletcher, 2017). Therefore, in the research edifice, critical realism formed the underlying paradigm for the work in this thesis (Figure 3).

On the continuum between positivism, i.e. knowledge obtained from empirical observation of objective phenomena (Chalmers, 2013), and constructivism or subjectivism, i.e. knowledge based on individually constructed perceptions of reality (Gergen, 1992), the critical realism paradigm occupies an intermediate position. Critical realism ontologically defines reality as objective and independent of what people experience, but it also recognises the role of subjective interpretations in defining reality (O’Mahoney & Vincent, 2014). In contrast to strong constructivism, which

leaves the question of reality unresolved and deems knowledge to be relative, critical realism states that ontology cannot be reduced to epistemology (Fletcher, 2017).

The work in this thesis applied a critical realism that approaches reality through a multi-layered perspective, where layers interplay to produce social activities, in accordance with Archer et al. (2013). The lower empirical level interacts with the middle (actual) level, which influences the highest (real) level. In this three-layered ontological domain, the empirical level is subject to interpretations and understandings, while the real level is considered to be objective (O'Mahoney & Vincent, 2014). This higher domain that exists regardless of observations can be linked to the environmental dimension of sustainability and economic conditions of businesses, which affect transition or non-transition of businesses to sustainability regardless of their knowledge and beliefs. The middle (actual) level constitutes the events or actions enabled or constrained by the real level. These are actions in response to real conditions. Here the actual domain is expressed in business model transformation activities taken by companies. The empirical domain is events observed, experienced and interpreted by people (Bhaskar, 2008). Papers I-IV collected examples of these and analysed data on companies that expressed a motivation to transform their business model as they interpreted this change as something positive.

The interactions between the layers of critical realism require a research design that can provide rich material for the researcher to understand the context and observables in the social world (Easton, 2010; Sayer, 1999). While some aspects of reality are not subject to change over time (e.g. laws of nature), observations and abstractions about reality (e.g. values, cultural beliefs, principles) are biased and theories derived from these will be affected by new available observations (Hutcheson, 2011). The robust logic of the laws of nature provides an opportunity to define the basic principles of sustainable development, while the routes or scenarios to achieve sustainability may need to change over time. Critical realism helps to see what might happen in a certain area and to reveal generative mechanisms and tendencies that affect the phenomena (e.g. business model), but does not provide definitive laws because of the complexity of the social world (Brown et al., 2002). Papers I-IV explored a combination of different perspectives from a variety of sources and from many stakeholders, in order to gain an understanding of the current 'reality' of business model transformation. As

a business model is a socially constructed and legally defined object formed by people and value, the results were expected to support or modify existing ideas about business model development.

3.2 Research strategy

Returning to the research edifice metaphor, the research strategy forms the middle level of the construct (Figure 3). As critical realism focuses on a deep understanding of the situation and observables in the reality, a qualitative research strategy was adopted in Papers I-IV as suitable for the context of discovery, i.e. when research is in its early phases and “when concepts are still vague and theories under development” (Pechmann, 2017, p. 26). In the context of discovery, understanding new ideas, concepts and their interactions is the goal of research (Yadav, 2010). The interest in this thesis was on discovery – generating new knowledge and opening up new viewpoints on sustainable business models of agri-food companies.

The discovery context created favourable conditions for qualitative research to generate a rich picture and deep understanding of why transformation to sustainable business may occur and how actors interpret and interact in these processes. Therefore, it can be said that the work in this thesis dealt with the complex processes underlying transformation (Granot et al., 2012). Due to the emergent nature of sustainable business model research, the work benefited from use of a qualitative approach focused on holistic understanding and perception of the context embeddedness (Gummeson, 2005).

The qualitative research strategy was operationalised through the case study approach. This included in-depth interviews, participatory observations and a review of secondary sources. Specific methodological choices in Papers I-IV are discussed in section 3.3. The outcome level of the research edifice (Figure 3) consisted of the findings in the papers, including the framework for sustainable value creation and the process model for stakeholder engagement.

To conclude, the research process involved cyclical movement between theory and practice to incrementally increase understanding about the research issues with each cycle of learning. To move between theory and practice, pre-knowledge about sustainable value was used in Paper I. The empirical studies in Paper II provided a theoretical understanding of the

sustainable value creation framework and helped in its revision. Paper III focused on one of the aspects of sustainable value creation, namely multi-stakeholder collaboration. Paper IV applied the knowledge obtained to create a teaching case on competencies for sustainable value creation and business model transformation for sustainability.

3.3 Methodological approaches in Papers I-IV

A variety of different methods can be applied in qualitative research (Creswell, 2014). The exploratory and descriptive character of the present work required case studies as a methodological choice. Case studies are a suitable method for illumination of complex social reality to answer ‘how’ and ‘why’ questions, which leads to deeper insights about the phenomena (Yin, 1989). Case studies allow acquisition of contextual knowledge, which is needed in situations related to human activity (Flyvbjerg, 2006). Papers I-IV addressed the research aims from different viewpoints and used different methodological approaches, as described in Table 3.

As shown in Table 3, a combination of methods was used to gather and analyse data in the empirical studies in Papers I-IV. This enabled triangulation, meaning multiple datasets, methods, theories and investigators (Webb *et al.*, 1999), which is important in stimulating more creative ways of data interpretation. Due to the novelty of the field of sustainable business models and their transformation for sustainability, such creativity is required (Ortuño & Dentchev, 2021).

Inductive reasoning is explorative in nature and provides an opportunity to grasp the multiplicity of actors, factors, actions and their connections (Eisenhardt *et al.*, 2016). Use of inductive reasoning involves generation of understanding from the observations and close links to the data (*ibid.*). However, a certain level of theoretical burden on the researcher cannot be avoided and requires traces of deductive logic. Applying a combination of deductive and inductive logics in the research process is known as abduction (Dubois & Gadde, 2002). To strengthen the process of abstraction, the abductive approach (‘abductive logic’) was applied in the present work by returning to the existing literature to observe research trends on sustainable business models.

Table 3. Research approaches used in Papers I-IV

Paper	Approach	Rationale for the choice	Industry
I	Method: Conceptual paper Data generation: Systematic database search Data analysis: Thematic analysis	Built the theoretical foundation for value creation in agriculture. Brought together theoretical perspectives on sustainable value creation in agriculture.	Agri-food sector
II	Method: Multiple qualitative case study Data generation: Three case businesses Data analysis: Thematic analysis	Developed data-driven codes to broaden the theory. Provided access to business model transformation topic in real life. Captures multiple aspects.	Agri-food sector
III	Method: Single qualitative case study Data generation: Single case study Data analysis: Thematic analysis	Enabled rich description of the case. Captured the complexity of business model change process.	Agri-food sector
IV	Method: Multiple qualitative case study Data generation: Eleven case businesses Data analysis: Thematic analysis	Focused on multi-stakeholder collaborations for sustainability. Developed data-driven codes to broaden the theory. Revealed unexplored themes in university-industry collaboration.	Agri-food sector

The data on which Papers I-IV were based are presented in Table 4. Paper I was a conceptual paper based on the systematic literature review method. Papers II and III involved multiple qualitative case studies, with data deriving from explorative in-depth interviews, participatory observations and secondary sources. Paper IV was a single case study based on an interview, field observations and a number of secondary sources.

Table 4. Empirical materials used in Papers I-IV

Paper	Data
I	Final dataset consisting of 108 scientific publications. Additional material on sustainable value creation included.
II	Three case businesses: - In-depth interviews with owner-manager and other key decision-makers - Field visits with observations - Annual reports, social media outputs and other public materials
III	One case business: - In-depth interviews with owner-manager - Field visit with observations - Annual reports, social media outputs and other public materials
IV	Eleven case businesses: - In-depth interviews with owner-manager and other key decision-makers - Field visits with observations

To analyse business model transformation for sustainability specifically in the agri-food sector, data were obtained from companies in that sector (for empirical articles) or from publications in agricultural journals (for the conceptual article). This was done to overcome a shortage of business model and sustainable business model research embedded in the agri-food context, where transformation to sustainability is most needed to address global socio-environmental challenges (Melchior & Newig, 2021).

3.4 Trustworthiness in research

The terms internal/external validity, reliability and objectivity are used to measure the trustworthiness of research (Eisenhardt et al., 2016; Yin, 1989). Alternative terms and measurements more suitable for non-positivist research paradigms (Denzin & Lincoln, 2011) include credibility, transferability, dependability and confirmability (Lincoln & Guba, 1985). Credibility means that the results of research are believable, which is achieved by deep engagement in the field, triangulation on different stages (e.g. data, theory, method) and engagement of participants. Transferability refers to how the results of research can be generalised and transferred to other settings and contexts. To establish transferability, a researcher provides rich descriptions of research conditions, process and assumptions central for

the enquiry. The idea of dependability is related to the assumption that the same result can be obtained with several measurements. While exactly the same results can be obtained in social conditions, qualitative researchers aim for a clear process of enquiry to achieve dependability. Confirmability relates to the degree to which others can corroborate the findings. For this, a researcher is open about the data and shows that the interpretations are grounded in this data.

Detailed descriptions of the methodology used in Papers I-IV are provided in the individual papers. Table 5 presents information on the trustworthiness in research design and case selection in the different papers.

Table 5. Trustworthiness of the research approach in Papers I-IV

	Paper I	Paper II	Paper III	Paper IV
Credibility and dependability	Prolonged study of the literature. Skills in working with literature. Stepwise research process.	Representative cases selected within purposeful group.	Instrumental case selected within purposeful group.	Representative cases selected within purposeful group.
Confirmability	Grounded in the literature. Regular reflection on the process. Expert involvement.	Grounded in theoretical findings in Paper I and the literature. Purposive sampling. Expert involvement. Several investigators.	Case identified through industry experts. Grounded in literature. Several investigators.	Grounded in the literature. Purposive sampling. Theoretical triangulation. Several investigators.
Transferability	Followed defined steps for systematic literature review.	Instrumental multiple case study.	Purposive single case.	Instrumental multiple case study.

Trustworthiness related to research approach and case selection was ensured in conceptual and empirical articles. The conceptual work in Paper I was based on a systematic literature review over several years, where the investigators became deeply engaged in the research topic. The objective of the work was reflected upon in collaboration with co-investigators. Experts in bibliometric studies were involved to establish valid and reliable literature search strings to retrieve data on value creation in the agri-food sector. The literature search and further analysis followed an established PRISMA-P protocol for systematic literature reviews (Moher et al., 2015). Further analysis was theoretically triangulated by inclusion of literature from the fields of business management and sustainability.

Papers II and IV comprised multiple case studies representative of the topic studied. The cases were examples of “best practice” in the respective field. In Paper II, the criterion for selection as a representative case was that the agri-food business should have transformed its business model for sustainability. All three cases were from Sweden, but were geographically spread, which allowed for comparisons between cases. The theoretical framework developed in Paper I, in combination with other literature on sustainable business models, was used to build the theoretical foundation for Paper II. Similarly, the cases in Paper IV were deemed to be representative if they engaged in collaborative relationships with universities that resulted in transformation to sustainability. They were selected to obtain an information-rich picture (Patton, 2014), and to reveal motivations and benefits for agri-food businesses to engage in multi-stakeholder collaborations. Theoretical triangulation was achieved by including perspectives from the university-industry literature stream, and from action-learning perspective.

Paper III was a single instrumental case study intended to “provide insight into a particular issue, redraw generalizations, or build theory. In instrumental case studies the case facilitates understanding of something else” (Mills et al., 2009, p. 474). The case (a cattle farm) was identified with the help of agricultural advisors and was illustrative of the subject of business model transformation in the agri-food sector and related competencies. Paper IV was grounded in business model literature and multiple researchers were involved in all stages of the process.

Due to the small size of the case businesses in all three empirical papers (II-IV), it was possible to interview the key decision maker, which provided access to the most up-to-date information on the business model.

The next steps in the research were data collection and analysis, where trustworthiness was again required. Table 6 lists the actions taken to achieve trustworthiness of the data in Papers I-IV.

Table 6. Trustworthiness in data collection and analysis

	Paper I	Paper II	Paper III	Paper IV
Credibility and dependability	Established search protocol. Pre-defined search query. Track record of data collection and analysis. Updates on search results. Rich description of applied methods. Peer debriefing	Detailed description of the context, business models of cases, transformation process. Presence of interview protocol. Rich interview narrative. Field visits. Peer debriefing	Detailed description of the context. Presence of interview protocol. Rich narrative about the case. Field visit. Debriefing with key informants	Detailed description of the context, collaboration process. Presence of interview protocol. Field visits. Participatory activities. Debriefing with key informants
Confirmability	Several databases as data sources. Data collected and analysed by several researchers	Multiple sources. Triangulation with methods and sources Data collected and analysed by several researchers	Multiple sources. Triangulation with methods and sources. Data collected and analysed by several researchers	Multiple sources. Triangulation with methods and sources. Data collected and analysed by several researchers
Transferability	Ensured data saturation through database comparison. Comprehensive description of research process	Comprehensive description of case companies. Different geographical contexts.	Comprehensive description of case company. Deep case analysis to create narrative.	Comprehensive description of case companies. Different geographical contexts.

		Deep analysis within and across cases. Application of NVivo software	Application of with NVivo software	Deep analysis within and across cases. Application of with NVivo software
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As shown in Table 6, Paper I followed the established research protocol to structurally evaluate published academic works. This included a narrow definition of the concept ‘value’ applied in the search, establishment of a pre-defined search query adapted to each database to retrieve consistent results, and a step-wise protocol for selection of relevant publications. The results of the search were updated regularly to include the most recent publications, and all search and analysis activities were documented and described in detail. Earlier versions of the article were presented at scientific conferences and the final version was published in a peer-reviewed scientific journal. These research practices supported the trustworthiness of the work.

In Papers II-IV, an empirical approach was applied. Data from different sources (e.g. interviews, documents, literature) were triangulated and multiple methods were used to build coherent conceptualisations. Textual empirical data were coded in NVivo software, to develop codes and categories. This was done in rounds and in collaboration with other investigators. When possible, interviewees were contacted to clarify some aspects of data. Papers II-IV all included field visits as a source of data. These field visits contributed greatly to the richness of the data, as the interviewees were in their natural settings and could use the settings to assist in their narratives. To address the transferability requirement, the sampling was empirically and theoretically diverse, although still limited by different contexts (e.g. geography, language, company size). However, each paper provided necessary elaborations and descriptions for others to test and develop the research further.

3.5 Sequence of work (Papers I-IV)

The conceptual work on current research on the topic of value creation in the agri-food sector and on creation of a theoretical framework for a sustainable

view on value creation was the starting point (Paper I). It was performed to compensate for the lack of studies on the topic of sustainable value specific to the agri-food sector. At that stage, it was impossible to find any scientific works that defined and conceptualised sustainable value creation in the agri-food sector, whereas definitions of traditional, only-for-profit value creation were in abundance. For this reason, traditional value creation was selected as a starting point for the review and a sustainability perspective (as it is understood in business management studies) was then added to create a theoretical framework for sustainable value creation in the agri-food sector (Paper I).

In parallel to the work in Paper I, work began on Paper II, where the concept of a business model as a vehicle for value creation was the starting point. All cases studied represented a transition from the only-for-profit business paradigm to sustainability-oriented business. This affected their business models and resulted in the creation of sustainable value, which was analysed using the theoretical framework from Paper I. Based on the collected empirical material, the theoretical framework was revised. Production of Paper II took several years and its different versions were presented at international conferences.

Work on Paper II in turn overlapped with the development of Paper III, which looked deeper into one case to investigate its business model change strategy for value creation. It operated under the same theoretical umbrella as the two previous studies, but took the form of a teaching case published in a peer-reviewed journal. Outputs comprised not only the main document, but also a teaching notes document with detailed instructions on how to use the case for pedagogic purposes. While based on the business models and value creation concept, Paper III examined aspects such as knowledge and skills needed for business model transformation for sustainability. This perspective increased understanding of specific elements of the framework for sustainable value creation in the agri-food sector, namely knowledge, education and skills.

Finally, Paper IV developed the topics of knowledge, education and skills as important elements of sustainable value creation and researched the elements of collaboration and relationships. Following the theoretical model from Paper I and considering the lack of research on knowledge and collaborations as elements of sustainable business in agriculture, Paper IV focused on farm cases that utilise knowledge from their collaborations with

universities to develop their businesses. It was based on empirical material collected during the period winter 2021-spring 2022.

3.6 Ethical considerations

In the empirical studies, several ethical aspects were considered. It was important to obtain consent from the participants and ensure their informed participation. Thus every participant was informed about the research project in general, the background of researchers, the data that would be acquired during participation and how those data would be used. During all contacts with the participants, these details of the study were communicated in writing, by email and verbally during the meetings.

The participants were always given an option for confidentiality in reporting of results. Only those who consented to disclose this information were named in the papers. Where possible, participants were contacted to check and clarify their statements and it was possible for them to withdraw or add any information. The documents used for the studies are either available to the general public or willingly shared with the researchers. Results of the studies published in the form of articles, reports, factsheets etc. were made available for open use.

3.7 Methodological reflections and limitations

The research design was not established from the start of the work. Instead, an emergent research design led by the data dominated the process. Strict planning simplified the decisions on the research design in each study and facilitated the work. The emergent design has advantages in terms of flexibility and consistency between the studies, with findings in one study leading to the questions investigated in the next. This design allowed the concepts of sustainable value and business model transformation to be developed from different angles. Moreover, the emergent design enabled development of my own skills, which is the central goal of doctoral studies.

The primary source of research data in all empirical work was interviews. This imposed certain limitations on the findings because, while interviews allowed the topic to be explored deeply, the interview setting might not have been comfortable for all interviewees and some experiences might not have been shared openly. For example, the interviewees might have preferred not

to mention negative experiences or actions that showed them in a bad light. Another issue was lack of time to establish a trustful relationship between researcher and interviewee, which poses many questions and doubts for any researcher. To address these shortcomings, some of the interviewees were contacted in advance to build some sense of familiarity and all were informed about the objectives of the study. In addition to interviews, field observations were a source of more objective information. In this, I worked on my interview skills in order to achieve deep conversation and to listen on different levels.

NVivo software was used for the analysis of the qualitative data in all empirical articles. This software has many useful features, but the process of data analysis with NVivo should be carefully planned in advance. On some occasions during the work in Papers II-IV, the abductive approach to data coding resulted in disagreement, and required revision. Reaching the abstraction level from this coding process became time-consuming and overwhelming. Nevertheless, this cyclical process of moving between data and theory made it possible to stay closer to the data and build richer insights into the cases. The software application allowed structured coding and the opportunity to recode and move codes around. The software also enabled an easier collaborative process, as the code structure could be shared between the researchers.

4. Research context

This chapter provides an overview of the empirical context of the work and presents the industrial and geographical dimensions. For the industrial dimension, a general description of the agri-food systems is provided (section 4.1). The geographical dimension comprised the European Union (EU) and Swedish context, as the studies were performed in these regions (section 4.2). Section 4.3 describes the business specifics of small and medium-sized enterprises (SMEs), as all case studies were SMEs. These cases are discussed in relation to their specific features.

4.1 Agri-food sector

According to the FAO, “a food system gathers all the elements (environment, people, inputs, processes, infrastructures, institutions, etc.) and activities that relate to the production, processing, distribution, preparation and consumption of food and the outputs of these activities, including socio-economic and environmental outcomes” (Timmermans et al., 2014, p. 12). This concept includes all interactions between human and non-human stakeholders, different activities and the ecological, social and technological dimensions (Rundgren, 2016). Today’s agri-food systems are globalised and interlinked: livestock in the EU is fed soybean meal from South America, where the soybean cropping system has been enhanced by a decline in mixed crop-livestock farming in Europe (Lassaletth et al., 2014).

The sustainable development challenges related to agricultural and food systems are complex and unpredictable (Bell & Morse, 2005; IPCC, 2019), calling for change to achieve sustainability (Tilman & Clark, 2015). The need for change is dictated by the higher food demand and damage that current agri-food systems cause to ecosystems and human health. Critical

areas requiring change are energy use, biodiversity loss, soil and water quality decline, and excessive pesticide use (Wilson & Tisdell, 2001). Human eating habits and behaviour, including food waste and food choices, are other areas needing change. Finally, food production, processing and distribution systems require transformation to decrease environmental costs and enhance societal benefits. All these changes can be achieved completely or partly by businesses. A company can affect consumer behaviour or change its production practices and other activities in the value chain by initiating collaborations with other companies, decision makers and society (Schroeder et al., 2019). Studying agri-food businesses can provide an understanding of necessary steps towards transition for sustainable development.

Agri-food systems possess a number of characteristics that are important for sustainability, e.g. they involve many stakeholders who are dependent on each other and they have broad economic, social and environmental impacts (Testa et al., 2022). These characteristics highlight the importance of a systemic approach when investigating processes and elements of the agri-food system, especially in transition to sustainability. To capture this complexity, a multi-stakeholder and multi-level perspective on value creation was applied in this thesis.

Being a mature industry with many incumbent firms, the agri-food sector tends to be resilient to change and creates systemic lock-ins to prevent any transformation. It has been shown that all actors in the agri-food system are involved in these lock-ins (Meynard et al., 2017). Dominant industrial agricultural practices contribute to ecological degradation and drive climate change (DeLonge et al., 2016). Therefore it is important to study any exceptional cases of sustainability transition occurring in the industry and to develop theoretical knowledge to advance this transition. The cases selected for analysis in Papers II-IV had transformed their business models for sustainability and had engaged in multi-stakeholder collaborations to acquire and implement knowledge on a sustainable agricultural business.

In parallel with the established agricultural regime, a growing number of newcomers without any farming experience are seeking to enter the agricultural domain. These external parties, who possess knowledge from outside the industry, result in different forms of farming characterised by a higher level of innovation (Cavicchioli et al., 2015). This dynamic setting creates an arena to study knowledge as a factor for sustainability transformation in agriculture. University-industry collaborations for

knowledge exchange have been extensively studied in many industrial contexts (e.g. Hurmelinna, 2004; López-Martínez et al., 1994; Rajalo & Vadi, 2017), while the agricultural context has received less research attention.

4.2 European agricultural and food systems

The regional characteristics of agri-food systems are dictated by climate and terrain and by official policies, socio-technical developments and consumer behaviours (Debonne et al., 2022). The agri-food businesses studied in this thesis, with cases from Greece, Italy, Norway and Sweden, operate in the European context, where agriculture has undergone substantial structural changes and has experienced several long-lasting trends. The most distinct structural changes are declining numbers of farms, increased farm size and shifts in production specialisation over time (Neuenfeldt et al., 2019). These macro-trends may have direct impacts for the future of agri-food systems and can potentially lead to sustainability or non-sustainability transformation of individual companies.

With the consolidation to larger farms and the gradual decline in the number of existing farms, there have been changes in agri-food system structure. Between 2003 and 2016 the number of farms in the EU-27 declined by 32%, from 15 to 10 million farms, while the number of farms larger than 50 ha increased by 7% in the same period (Jacques & François, 2022). The projection is that by 2040, the EU will have experienced a further decrease of 62% in the number of farms relative to 2016 (ibid.).

This structural change has been interlinked with value shifts in European agriculture. On one extreme is the productivism value system, with its focus on production volumes and low food prices for consumers. On the other extreme is the post-productivism value system, with the focus on alternative farming systems and a shift in consumer preferences to exclusive, traceable and high-quality products (Debonne et al., 2022). The emergence of large-scale operations is an example of productivism, while post-productivism is a multi-dimensional notion with bottom-up initiatives (e.g. agroecology, alternative food networks) and top-down policies (e.g. EU Green Deal). This thesis studied cases of post-productivism farms which, due to certain factors, had either transformed their business to sustainability or had a sustainability agenda at their core from the outset.

The European population is ageing, especially in rural areas, resulting in labour market and social challenges (Corselli-Nordblad & Strandell, 2020). Weak generational turnover causes changes in farm ownership. More than 30% of farmers in the EU are over 65 years of age and only 6% are younger than 35 years (Schuh et al., 2022). Many retiring farmers are forced to sell their land, as there is no successor in the family (Corsini et al., 2015). Poor economic opportunities for young people, combined with difficulties in acquiring land, create large gaps in agricultural pathways, which has resulted in “youth deserts” in parts of Germany, Spain, Italy, Greece and France (Oltermann et al., 2020). Agricultural education and sources of knowledge are a decisive factor in creating actions to reverse this trend. This thesis examined knowledge exchange between universities and farmers, including students’ role in these relationships.

Urbanisation is an accelerating trend and in coming decades urban areas are expected to host ever-increasing numbers of people, who will require a stable food supply deriving from conventional and urban agriculture (UN DESA, 2016). Urban agriculture means “a permanent and dynamic part of the urban socioeconomic and ecological system, using typical urban resources, competing for land and water with other urban functions, influenced by urban policies and plans, and contributing to urban social and economic development” (FAO, 2007, p. 59). This definition covers all three dimensions of sustainability, which imposes obligations on companies to act responsibly. While this thesis studied rural companies, the framework for sustainable value creation (Paper I) and the process model for stakeholder engagement (Paper IV) can be applied to urban contexts due to their generic character.

Another relevant trend is the change in consumer eating habits towards product differentiation. In Europe, there is increasing consumer demand for high-quality food with special features such as organic, local, free from artificial additives and generally traceable (Santeramo et al., 2018). Thus it is appropriate to investigate producers seeking to satisfy this demand for differentiated products: how their business model is transformed, what value they create and capture, and how this affects the sustainability of this business.

4.3 Specifics of small and medium-enterprises (SMEs)

Small farms (farming less than 5 ha) represent 67% of all farms in the EU and medium farms (5-19 ha) make up 20% (Jacques & François, 2022, p. 35). In business terms applicable to any industry, such farms are referred to as SMEs. Enterprises of this size are a dominant organisational type (Soundararajan et al., 2018) representing 99% of all business entities and employing 60% of the working population in OECD countries (OECD, 2019) and up to 70% globally (ITC, 2019).

SMEs have a distinct set of characteristics that distinguish them from large corporate players. These characteristics are exemplified in operational practices, strategic decision and attitude to sustainability. The distinguishing characteristics of SMEs include: form of ownership (private), governance (informal and self-regulatory) and organisational structure (flat and multipurpose) (Spence, 2016). Such enterprises are typically limited in resources, including lack of knowledge (Tilley, 2000), but they are also autonomous in decision making (Spence, 2016) and independent in their social and political activities (Rutherford et al., 2000). The empirical cases analysed in this thesis were small-scale farms and some results of these analyses were discussed in relation to the specifics of SMEs.

5. Summary of Papers I-IV

This chapter presents a structured summary of the results obtained in Papers I-IV on aspects of sustainable value creation by businesses from the agri-food sector (sections 5.1-5.4). These results provide a better understanding of how sustainable business can be achieved in an agri-food context.

5.1 Paper I

Title: Reviewing value creation in agriculture – a conceptual analysis and a new framework

5.1.1 Background and objectives

The creation of value is essential for any enterprise, although the sources of value creation and its beneficiaries call for re-evaluation. In light of the pressing environmental and social challenges of today, one-dimensional profit-maximising purpose of value does not correspond to the vision for a sustainable future. Integration of the principles of sustainable development with those of value creation has affected the understanding of value, establishing a need to conceptualise it in this new light. To address this gap, a context-specific investigation of value creation concept was conducted in Paper I. The focus was on the agri-food sector, since it plays a crucial role in global sustainability and has not been fully covered by conventional management research.

Motivated by such shortcomings, Paper I reviewed the conceptualisation of value creation in the agri-food sector and developed a new framework for sustainable value creation in the sector (Figure 4).

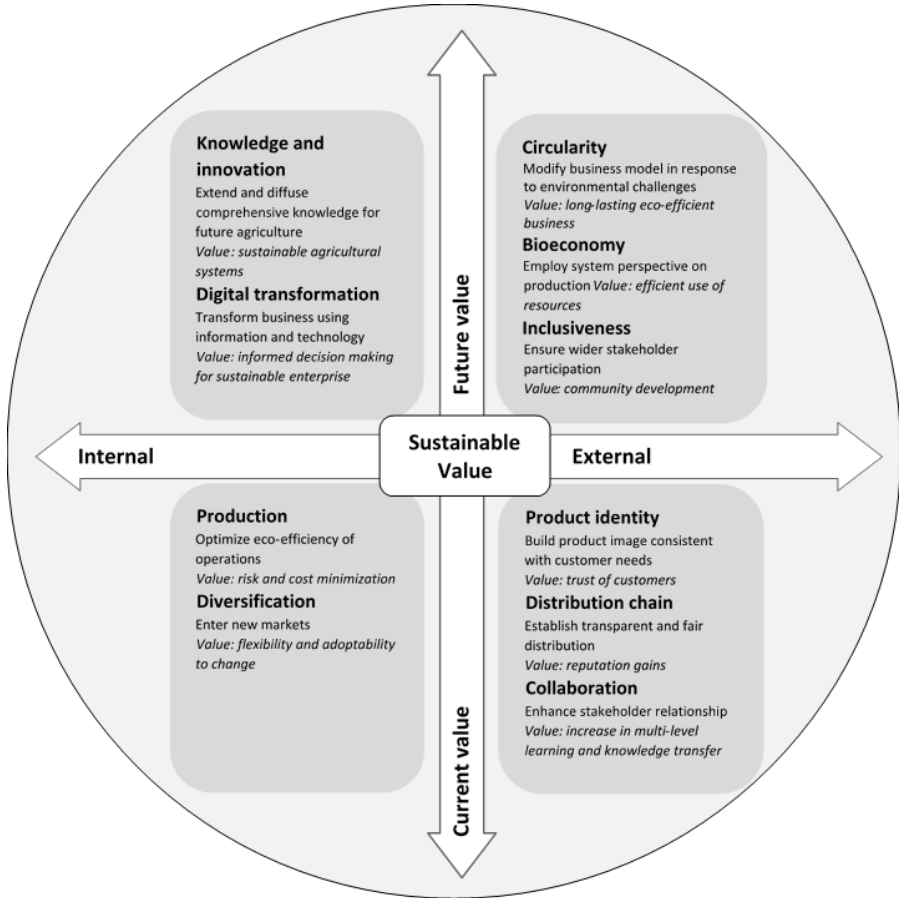


Figure 4. New framework for sustainable value creation in the agricultural sector

To achieve this, a systematic literature review was conducted to identify value creation factors in agri-food businesses. In development of the new framework, the factors identified were analysed from the perspective of sustainable value and areas for future research were outlined. Paper I laid the foundation for research directions addressed in Papers II-IV.

5.1.2 Main findings

Systematic analysis of 108 scientific publications revealed 23 factors important for value creation in the agricultural sector. These factors were

thematically aggregated into nine clusters: collaboration, communication, diversification, knowledge, production, entrepreneurship, funding, incisiveness and policies. Further analysis revealed a diversity of sources of value creation, but also highlighted the limitations in the approach of value creation that focuses on financial gains for shareholders. To tackle this limitation and introduce a systematic perspective on sustainable agricultural business, a new conceptual framework for sustainable value creation was developed (Figure 4). It consists of four segments along the horizontal “internal-external value” axis and vertical “current-future value” axis to create a long-term, multi-stakeholder logic of value creation. The topics of sustainable value creation in the framework integrate environmental, social and economic purposes of value for the agricultural sector.

5.1.3 Main contributions

The main contribution of Paper I was to improve understanding of value creation by conceptualising it based on the context of agri-food businesses. This in turn helped clarify the value creation concept. This context had the potential to provide specifics that can be applied in general theory development. The specifics of agri-food businesses were found to be exemplified in a strong focus on collaboration, knowledge and production as sources of value, but limited understanding of the purpose of value as financial gain.

To advance the sector towards sustainability, the new framework was used to examine the multi-dimensional nature of sustainable value by integrating environmental, social and financial perspective with a multi-stakeholder view. The results confirmed that the framework enables dynamic and systemic examination of a business with regard to its sustainability performance. The framework also gives a direction for strategic and operational transformation of a business towards sustainability. In a business striving to achieve sustainable performance, all topics in the framework should be addressed in a balanced way. The framework also provides guidelines for the design of sustainable value propositions and analysis of system-level sustainability.

5.2 Paper II

Title: We do it our way – small-scale farms in business model transformation for sustainability

5.2.1 Background and objectives

The creation of value is the fundamental purpose of a business model. With businesses committing to sustainable behaviour, the value concept is now being broadened to include environmental and social dimensions. This transformation of the purpose of value creation is affecting business model structure and processes. While there is agreement on the existence of a connection between value and business models, the nature of this connection remains unclear. To address this gap, an empirical study on business model transformation related to the creation of sustainable value was conducted in Paper II, using cases from the agri-food sector.

Businesses in the agri-food sector face sustainability pressures and must also operate in a competitive market environment. Global trade, technological developments and retailer power favour large corporate producers, limiting opportunities for small businesses. In this environment, small businesses must search for alternative business strategies. In some case, this search results in a sustainably oriented business. Different cases of small agri-food businesses were examined in Paper II to identify factors in business model transformation, changes in the segments of business models and value created.

5.2.2 Main findings

The analysis revealed that the owners-managers of the case businesses were experiencing a number of internal and external factors that affected their decisions in regard to business model transformation for sustainability. Some of the factors were seen as threats (e.g. insufficient advisory service, complicated distribution chains, low level of business strategy knowledge). Other factors were seen as positive driving forces (e.g. demand for high-quality products, variety of sales channels, personal beliefs in fair and ethical business). Due to the influence of these factors, changes were needed in every segment of business models of the case businesses. Comparison of the cases revealed the presence of some generic change strategies (e.g. transformation to short sales channels) and some case-specific strategies

explained by the geographical location and micro-context of each business, such as collaboration opportunities, available resources or existing competences.

Analysis of value created as a result of these changes with the help of the framework developed in Paper I showed that the majority of value-creating activities were located in the “current” part of the framework, with fewer activities in the “future” part. This uneven distribution indicates a need for more changes to achieve a higher level of sustainability among the case businesses. Consistent barriers to change, such as insufficient knowledge on business development and a low level of learning were identified. Building on the empirical evidence obtained for the three case farms, the framework for sustainable value creation was revised in Paper II by addition of topics identified as being potentially important for current and future sustainable value creation. These topics included technology, policies, funding, product quality, marketing, communication, education, skills, access to information and trust.

5.2.3 Main contributions

Paper II improved understanding of the connection between value creation and business models. Choice of business models by the case businesses affected how value was created and the amount. By exploring transformation of the business models, it was possible to identify and analyse value activities that were created as a result of this transformation. This ties together business model literature and value literature.

These findings contribute to the scientific discussion on sustainable business models and sustainable innovation by providing contextual evidence from the agri-food sector showing that a close connection to natural resources, in combination with sustainability-oriented personal beliefs, creates incentives for business transformation towards sustainability. The work also helped in refining the framework for sustainable value creation in the agricultural sector by re-organising and adding several value creating topics.

5.3 Paper III

Title: Sustainable value creation – a farm case on business model innovation

5.3.1 Background and objectives

Agricultural production affects the environment, society and the economy and is important for human health, economic growth and climate change. These are some reasons why transformation of agricultural practices to sustainability are needed. From a business-level perspective, many small businesses are resource-dependent and follow low-cost production logic, which limits their opportunities compared with large-scale producers. One way to overcome this is to develop a strategy focused on innovative business models and sustainable value proposition. Pursuing such a strategy requires knowledge and a set of competencies in management, marketing and strategic decision making.

The teaching case developed in Paper III looks at the process of business model change of a small agricultural business, in order to explore its value creation strategy and identify competences enabling transformation to a sustainable business model. It involves activities such as mapping the existing business model, generating suggestion for business model change and proposing implications for agricultural policy.

5.3.2 Main findings

Development of the teaching case based on a Swedish cattle farm made it possible to map the activities in different segments of the farm's business model. It also revealed that individual beliefs of the owner regarding business and competences were highly relevant for business model transformation for sustainability. A decision to work in short sales channels by the owner affected the structure of the business model on the production and customer side. The owner had concerns about animal welfare and took actions to increase the well-being of the farm's cattle. This required capital investment, but improved the sustainability of the farm. The owner had extensive knowledge on agricultural production in practice, but recognised personal shortcomings in competences related to marketing, strategy and sustainability. To compensate for these shortcomings, the owner made many decisions relating to these topics in consultation with other people or based on intuition.

5.3.3 Main contributions

The distinctive contribution of Paper III was dictated by its format. The teaching case produced makes a practical contribution to further education in agricultural and business management studies by allowing students to analyse real-life situations and develop hands-on solutions. When working with the teaching case, students can familiarise themselves with current challenges for an agri-food business and work on solutions based on sustainable development principles and a multi-stakeholder perspective.

In addition to the primary practical contribution as a teaching case, Paper III extended current knowledge on the competences and skills required to pursue business model transformation for sustainability in the context of small agri-food businesses. It also improved understanding of the multi-stakeholder perspective in decision making.

5.4 Paper IV

Title: Engagement of stakeholders in action-oriented education for sustainability: A study of motivations and benefits and development of a process model

5.4.1 Background and objectives

The complexity of socio-ecological and economic conditions means that careful consideration of the interests of different stakeholders is needed in order to facilitate transformation to sustainability. Multi-stakeholder collaborations are one of the pillars of sustainable development and can facilitate creation of sustainable value for the participants. Paper IV examined value created for businesses in their engagement with universities and sought to identify factors involved in collaborations between agri-food businesses and universities. The work included analysis of benefits and motivations expressed by the business owners and development of a conceptual model for university-industry collaborations.

5.4.2 Main findings

Empirical material on 11 agri-food businesses which actively collaborate with universities revealed a number of motivations and benefits for the businesses. Thematic analysis of data revealed three categories of motivation (inspiration, marketing, sharing experience), two benefits (energy, problem-

solving) and four combined categories (exchange, new knowledge, new workers, practical contribution). The business owners were generally positive about their collaborative engagement with the universities, emphasising intrinsic motivations such as flow of energy, knowledge and inspirations. Problem solving and other practical contributions were seen as benefits of these collaborations. The empirical evidence, in combination with findings in the literature review, was used to develop a process model for stakeholder engagement that is intended for educational collaborations.

5.4.3 Main contributions

Paper IV contributed to the scientific discussion on use of a multi-stakeholder approach in sustainable development by providing a deeper understanding of university-industry collaborations. Specific motivations and benefits in such collaborative relationships were identified and the analysis demonstrated potential for sustainable business and sustainable education in multi-stakeholder collaborations. The collaborations were found to have real effects on farm businesses, manifested as changes in production processes and discovery of new marketing opportunities.

The conceptual model developed in Paper IV provides guidelines on the engagement process and can be used as a practical tool to assess and facilitate multi-stakeholder collaborative process. The engagement of multiple stakeholders can transform education from narrow individual disciplines to integration of multiple knowledge sources and a variety of learning arenas.

6. Discussion

This chapter outlines and discusses the most important findings of this research (section 6.1) and provides a summary of its theoretical contribution (section 6.2).

6.1 Summary and discussion of findings

The focus throughout this thesis work was on sustainable value and sustainable business models in advancing transformation to sustainable agricultural business. Analysis of the concept of value in the agri-food sector and business models of agricultural companies revealed a multiplicity of value creation activities, a range of motivations for sustainable business model transformation and interconnectedness between companies and their external operating environment. Table 7 presents a summary of the findings in Papers I-IV and indicates the novel contribution/s of each paper.

Table 7. Summary of findings and contributions of Papers I-IV

Article: Research question/s	Main findings	Main contributions
Paper 1: What are the principles of sustainable value creation in the agri-food context	<ul style="list-style-type: none"> • Current understanding of value is multifaceted, but the purpose of value creation is one-dimensional (economic gain) • Most value-creating activities target short-term goals • Few agricultural business strategically target innovation, knowledge acquisition and multi-stakeholder collaborations • Development of a new framework for sustainable value creation in agricultural sector that includes: 1) environmental, social and economic dimensions; 2) contextualisation to agri-food sector; 3) short- and long-timeframe; 4) systemic perspective 	<ul style="list-style-type: none"> • Highlighted the complexity of value creation in the agri-food sector • Identified factors in value creation in the agri-food sector • Introduced sustainability principles to the understanding of value in the agri-food context • Demonstrated the importance of knowledge acquisition and a multi-stakeholder perspective for sustainable value creation • Showed that sustainability in agricultural business is achieved by transforming company and its environment (system level)
Paper II: What are the principles of sustainable value creation in the agri-food context? How can business models be transformed to create sustainable value?	<ul style="list-style-type: none"> • Internal and external threats to sustainable business model transformation • Internal and external drivers for sustainable business model transformation • Generic and specific strategies for sustainable business model transformation • Sustainable value-creating activities undertaken by agri-food businesses 	<ul style="list-style-type: none"> • Integrated value creation and business model concept • Explained business model transformation for sustainability in the agri-food sector • Identified factors for sustainable business model transformation • Demonstrated the importance of incremental business model innovations for business transformation to sustainability

		<ul style="list-style-type: none"> • Tested and reviewed the framework for sustainable value creation in agri-food businesses • Highlighted dynamism of the transformation processes • Made a practical contribution to agricultural education • Extended knowledge on sustainable value creation • Linked value creation and business model concept
<p>Paper III: How can business models be transformed to create sustainable value??</p>	<ul style="list-style-type: none"> • Competences and skills for business model transformation in small agri-food businesses • Sustainable value creation activities • Role of knowledge in transformation to sustainable business 	<ul style="list-style-type: none"> • Made a practical contribution to agricultural education • Extended knowledge on sustainable value creation • Linked value creation and business model concept
<p>Paper IV: Can multi-stakeholder collaboration contribute to the sustainability of agri-food companies?</p>	<ul style="list-style-type: none"> • Benefits and motivations for agri-food businesses in multi-stakeholder collaborations • Collaborations between universities and agri-food businesses contribute to sustainable transformation • There is two-directional flow of knowledge • University-industry collaboration is a circular process 	<ul style="list-style-type: none"> • Revealed the role of multiple stakeholders in transformation to sustainable business • Promoted a strategic view on university-industry collaborations • Developed a process model for engagement of non-academic stakeholders in collaborations with universities

Setting sustainable value at the core of sustainable business models is a vehicle for transformation to sustainable business. Through this transformation, entire agri-food systems can be changed. Research question RQ1, on the meaning of sustainable value in agriculture, was addressed in Paper I by reviewing the current understanding of value creation in the agri-food sector and re-conceptualising value by adding a sustainability perspective. This research question was further addressed in empirical

investigations evaluating sustainable value by considering the factors and activities of business model transformation in the context of small agri-food businesses (Paper II) and examining business model transformation with special attention to knowledge and competence of a company (Paper III). These studies improved understanding of business model transformation by agricultural businesses, answering research question RQ2. The final analysis, on collaborations and knowledge exchange as topics of business advancement for sustainability (Paper IV), addressed research question RQ3 on multi-stakeholder collaborations for the sustainability of agri-food companies.

Identifying patterns in business model transformation for sustainability

The owners-managers of small agri-food businesses face a range of challenges that are within or outside their influence. When they engage in a transformation process, the outcome is not clearly visible from the beginning, but there is an understanding that their business will take a different position. Prevailing challenges act as triggers for change to address social environmental and market challenges (Roome & Louche, 2016), while triggering events create and promote the idea that new opportunities accommodating sustainability principles can be found in the market. There is often a radical change from existing thinking when new concepts have to be understood and put into practice.

Awareness of existing challenges is reinforced by the individual beliefs and mind-set of the key decision-maker. In small agricultural businesses, the beliefs of the owner-manager guide leadership behaviour towards organisational sustainability. Corporate research has shown that when engaging in transformation for sustainability, the belief system of senior managers affects strategic decisions and requires new know-how (Stubbs & Cocklin, 2008; van Kleef & Roome, 2007). The leadership and beliefs of owners-managers probably play the most significant role in transforming business models for sustainability. For municipal authorities seeking a strategic transition to sustainability, research has shown that the commitment of leaders to the process of transition is crucial for success (Wälitalo et al., 2020). The work in this thesis showed that the set of beliefs held by the owner-manager can initiate learning and experimentation in the organisation.

This helps understand the relationships between organisational learning, leadership and change to a sustainable organisation.

Another discovery from the empirical studies was that owners-manages make a conscious decision to combine sustainability principles (environmental and social concerns) and economic logic in the performance of their business. Economic viability is deemed necessary to achieve sustainability and profits are seen as a means for sustainable value creation. Thus for owners-managers profit is clearly not the sole overall goal of business activity, and customer satisfaction and willingness to align with own beliefs also drive transformation. This is in line with the argument that sustainable business models must integrate all dimensions of sustainability (Broman & Robèrt, 2017; Upward & Jones, 2016) and define value creation in a more holistic way (Lüdeke-Freund & Dembek, 2017; Robèrt & Broman, 2017). In agreement with the business case for sustainability, understanding and proactive commitment to the basic principles of sustainable development is self-beneficial for participating businesses (Broman & Robèrt, 2017).

Earlier research has reported greater difficulties for incumbent firms engaging in sustainability-oriented business in comparison with start-ups, because of the dominant commercial logic (Loorbach & Wijsman, 2013). For such cases, the advice is to take bold strategic decisions and demonstrate strong commitment to sustainability (Casadesus-Masanell & Zhu, 2013), since only then will business models be transformed. This thesis showed that, driven by personal beliefs of the owners-managers, small agri-food businesses prioritise social and environmental objectives and view profits as a means to achieve sustainability goals. This creates good conditions for business model transformation even within established businesses. The thesis also showed that the new business models include elements of re-definition and radical change – the two ways of adopting sustainability principles into a business model (Rauter et al., 2017). For instance, the case businesses started to support local value creation, used source labelling, increased stakeholder participation, entered new markets and changed the products they offered. These are activities that can be classified as both re-definition and radical business model change.

The work in this thesis revealed consistency and commonality between business model activities to create sustainable value, with case businesses having clear priorities that establish their current and future behaviour. The benefits of this determination are reliability that is visible for stakeholders in

the network and opportunities to co-create value with stakeholders who share similar beliefs. In line with findings in other studies (Breuer et al., 2018), the case businesses sought to integrate like-minded stakeholders into the value creation process. The downside of this determined behaviour was the risk of losing organisational flexibility, e.g. certain markets, investors or technologies might be ruled out due to their misfit with the owner's beliefs. This is referred to in the literature as 'path dependency' (Sydow et al., 2009) and has not received sufficient attention in the business model literature.

The studies in this thesis revealed that structured and clear knowledge on sustainability is needed to translate personal beliefs of owners-managers into a better-defined business strategy and facilitate transformation of business models. The new business models emerged as an outcome of personal beliefs combined with the acquisition of new knowledge. Therefore, access to more structured information on the principles of sustainable agricultural business can facilitate higher levels of organisational learning and guide proactive transformational behaviour of businesses. This is similar to the idea that clear guidelines on sustainability can assist a business in defining its sustainability objectives (Morioka et al., 2018). It is often claimed that new business models are derived from the acquisition of knowledge (Roome and Louche, 2016), but the findings in this thesis suggest that knowledge acquisition is a cyclical self-reinforced process where knowledge affects business model transformation, which in turn creates a need for new knowledge.

Multi-stakeholder interactions for sustainability

This thesis improved understanding of how and why small agricultural businesses commit to sustainability. The investigations revealed that long-term sustainability of an agricultural business is unachievable without knowledge and multi-stakeholder collaborations. These factors, among others, play a crucial role in the ability of a company to transform its business model. Inter-organisational and multi-stakeholder collaborations that enable business model transformation for sustainability have received limited attention in the literature (Engwall et al., 2021). The findings in this thesis show the open character of sustainable business models that enables co-creation of value with actors from the network.

Creation of sustainable value is an activity that crosses organisational boundaries. For example, the case businesses collaborated and integrated

with outside stakeholders to transform and apply their new business models. Previous research has characterised this as an ‘open business model’ (Chesbrough, 2006). This thesis showed that openness is an inherent feature of any sustainable business model. The new sustainable vision adopted by a business through the beliefs of the owner-manager is expanded through the relationships with other stakeholders. Supply partners, customers, local communities are influenced by this new vision, which helps building change among the stakeholders involved.

Sustainability aspirations of the owner-manager drive learning and competence development inside and outside the organisation. This shapes operational practices for the business and changes practices in the network of partners and customers (Roome & Louche, 2016). Together with partners in the value network, the business experiments, develops new value offers and engages in joint learning. The focus of value creation shifts from product to system. In this manner, business model transformation for sustainability happens not in one organisation, but in the network where new arrangements with stakeholders are developed. The advances in learning create new structures for performance and reinforce change (Clarke & Roome, 1999). For businesses, successful learning requires interactions with knowledgeable actors who bring competences and information. These findings support the network perspective on value creation (Bocken et al., 2014; Breuer et al., 2018).

The environmental and social aspects of value creation help businesses engage with customers and partners who share same concerns. At the same time, the economic logic in business models engages customers who do not focus on sustainability and are interested in other product characteristics (e.g. quality, taste). This ability to satisfy the needs of different stakeholder groups enhances the dedication of the business to sustainability goals and creates trust with customers. Previous studies have suggested that this dedication creates incentives for other actors in the network to start transformation to sustainable business models and, due to consistency in the behaviour of businesses, builds credibility and reputation among partners and customers (Schneider & Clauß, 2020).

Collaborations and multi-organisational interactions have been identified previously as important drivers for business model transformation (Engwall et al., 2021). Engagement in new business models means new forms of collaboration for businesses (Clarke & Roome, 1999). To acquire previously

unavailable knowledge, businesses may look for collaborations with advisory services and universities. These collaborations can facilitate business model transformation and broaden understanding of value, thus benefiting from acquired competences and resources.

Overall, the findings in this thesis confirm the importance of multi-stakeholder collaborations. However, they also show that a network perspective is not one of several features, but a fundamental characteristic for sustainable value creation.

6.2 Theoretical contribution

The theoretical contribution of this work lies in the conceptual domain, by presenting a new framework for sustainable value creation in the agri-food sector that includes principles and areas of the creation of value needed by agri-food businesses for transformation of their business models. This conceptual model emphasises the need to integrate, in equal measure, economic, social and environmental principles of sustainable development into value creation logic. This adds to the ongoing discussion on strategic system transition towards sustainability (Broman & Robèrt, 2017).

The vision and conscious choices of owners-managers dictate the logic of business model transformation (Casadesus-Masanell & Zhu, 2013). The conceptual and empirical studies in Papers I-IV demonstrated that sustainability can be placed at the core of an organisation. Therefore, sustainable business models are characterised by integrative logic (Schneider & Clauß, 2020) and are designed to achieve complex sustainability goals. This challenges previous claims that economic logic conflicts with social or environmental goals of a business (Battilana & Dorado, 2010; Pache & Santos, 2013) and may potentially interfere with organisational performance (Tracey et al., 2011).

In sustainable business models, economic goals can be a way to support essential social and environmental aspirations by dictating strategic and operational decisions and opening new markets. However, commitment to social and environmental principles creates restrictions by denying certain opportunities that do not correspond with beliefs of owners-managers. In line with Schneider and Clauß, (2020), in the case businesses these restrictions were accepted and the trade-offs were well-understood. The restrictions even resulted in clearer actions and decisions by the case businesses.

Previous literature on the network nature of business models highlighted the importance of multi-organisational collaborations for business model transformation (Clarke & Roome, 1999; Nielsen & Lund, 2014). This thesis confirmed the open character of sustainable business models and showed the importance of inter-organisational interactions for the businesses to navigate transformation to sustainability. The previous literature focused on intra-industry collaborations, while this thesis identified cross-industry engagements as an important factor in knowledge and competence acquisition that facilitates business model transformation. It also revealed that co-creation of value with multiple stakeholders is a result of a business's credibility and trust-building efforts.

In the literature on business model transformation, a view of a business model as a stable construction still prevails. However, an opposing dynamic perspective is also developing (Achtenhagen et al., 2013; Demil & Lecocq, 2010). The research in this thesis aligns with the latter perspective and shows the dynamism behind business model transformation for sustainability. A circle of reinforcement of business model transformation was identified. Through managerial choices and consequences, changes for sustainability are reinforced in business models. Changes are initiated by owner-manager beliefs, but are reinforced by acquisition of new knowledge, development of capabilities and integration of stakeholders into the creation of sustainable value. This emphasises the impact of leadership (Rauter et al., 2017; Wälitalo et al., 2020) and organisational learning for dynamic transformation.

7. Conclusions

- Businesses can be a solution to global sustainability challenges and the way to sustainable business is creation of sustainable value and adoption of sustainable business models by businesses. Moving in this direction will contribute to sustainable development goals and also produce competitive advantages for a business. However, moving in this direction also requires businesses to understand complex concepts such as sustainability, business model and multi-stakeholder approach, commit to them and apply them at strategic and tactical level.
- Business models are primary drivers for change towards sustainability, but many aspects of business model transformation need to be identified. This thesis improved understanding of how sustainable value is created by the transformation of business models for sustainability by identifying principles of sustainable value creation for agricultural businesses, and by showing how business models can be transformed to create sustainable value in agricultural companies and how multi-stakeholder collaboration contributes to the sustainability of agricultural businesses.
- Patterns in principles and practices of business model transformation for sustainability were identified. In particular, external drivers in combination with individual beliefs of a decision-maker appeared to initiate the process. This highlights the important role of agency in sustainability transitions.
- Small-scale businesses in the agri-food sector were found to combine profit-oriented logic with social and environmental views, where economic success was often seen as means to meet sustainability aspirations. This can be instrumental in promoting the

‘business case for sustainability’ and potential self-benefit of proactive steps towards sustainable business.

- Lack of knowledge and inability to engage in learning hinder organisational engagement in transformation for sustainability.
- Sustainable business models have an open character, and multi-stakeholder collaborations support business model transformation for sustainability.

7.1 Implications for practice and policy

Applying the framework for sustainable value creation in agriculture developed in this thesis can help organisations understand the principles of sustainable value and set the directions for possible implementation. Understanding different areas of sustainable value creation can help overcome existing institutional practices and establish value-generating processes.

Supporting the adoption of sustainable business models in agriculture will require consideration of their network-reliant nature. By actively utilising networks and engaging with multiple stakeholders, businesses can create space for new opportunities. The network perspective provides access to resources, competences and ideas that are not available to the isolated business. In collaborations, new technologies become accessible, negotiating power can be gained and support can be received. At the same time, collaborations for sustainability pose certain demands and risks. All partners should have similar commitment to the ideas of sustainable development, to collaboratively create sustainable value. Accordingly, the risks are differences in vision, dependency on other actors and possible competitive disadvantage if the collaborative project is unsuccessful.

The personal beliefs of the decision-maker play a crucial role in setting the purpose and initiating transformation of a business for sustainable value creation. Such transformation is more difficult for incumbents, which should seek to initiate change through definitive strategic decisions to commit to sustainability and place it at the core of a business. If this is not done, sustainability logic will stay on the periphery of profit-oriented activities.

To address global challenges and stimulate transformation for sustainability, policies at national, regional and local level should promote formation of networks of stakeholders for partnership and knowledge

exchange. Business model transformation can potentially lead to system sustainability transition, so policy instruments that encourage cross-industry collaborations should be created. This will trigger a variety of stakeholders to model future scenarios.

7.2 Limitations and future research

This thesis addressed some existing gaps in the sustainable business model literature and identified interesting directions for future research. There were also some limitations of the work.

The broad range of studies in this thesis is both a strength and a weakness. The aim was to understand sustainable value and its creation in business models in the context of the entire agri-food sector, requiring a systemic and multidisciplinary approach. Findings from business model research, corporate sustainability and stakeholder theory were used to develop a general understanding of sustainable value in the agri-food sector. In future research, it would be valuable to integrate sustainable business model and sustainability transition research by examining e.g. how choice of business model affects system-level transition towards sustainability by businesses and by creating a novel business model archetype to promote system-level transition to sustainability.

Use of the framework for strategic sustainable development in the agri-food sector is a promising direction for future research. When exploring sustainability transition, equal attention should be given to the socio-ecological and techno-economic dimensions.

All case businesses studied in this thesis had transformed their business model to include sustainability, but had not explicitly defined sustainability for their business on conceptual or operational level. Nevertheless, the case businesses managed to act upon their fuzzy understanding of the concept and had implemented changes for sustainability. Discussion about the importance of a clear definition of sustainability is ongoing, but without understanding the goal, it is difficult to choose a path to achieve it. An operational model for implementation of sustainability principles is needed.

The qualitative nature of the work in this thesis limits the generalisability of the results. Paper II was based on cases from one country, preventing exploration of the variety of value creation activities in different geographical, cultural and economic contexts. Paper I relied on general

businesses management literature to conceptualise value creation, but this term might differ in the agri-food context. Therefore, the literature review may have revealed only part of the answer. However, it helped explore the field of sustainable value and to lay the foundation for further exploration and testing. Future studies could apply other research approaches and strategies to validate and extend the results. Quantitative testing with a larger sample of companies or mixed methods could help reveal the connection between sustainable value and business models in the agri-food sector.

This thesis revealed a multiplicity of value creation activities in agri-food businesses and a combination of sustainability and profit orientation as a purpose of business. Further studies should focus on managers' commitment to sustainability. In the context of small agricultural businesses, studies on the personal beliefs of owners-managers and their leadership style can provide relevant information that supports policy recommendations to stimulate a shift towards placing sustainable purpose of value creation at the core of a business.

Even in cases where agri-food businesses had adopted sustainable business models and addressed environmental and social aspects of their business, the beneficiary of value in all cases was humans. Future research could explore why non-humans (e.g. animals, nature) are not equally included in value creation purpose. The concepts of 'value of nature' and 'value for nature' need to be integrated into business models.

The focus on small-scale businesses opened more avenues for future investigations. The case businesses were driven by the determination of their owners to achieve sustainability. This created a positive image and credibility for internal and external stakeholders of the businesses. However, studies based on large-scale companies show that such determination leads to a range of limitations and reduces business flexibility. Future studies should examine whether similar limitations apply for small-scale businesses and whether the owners are aware and accept such restrictions imposed by their sustainability beliefs.

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Popular science summary

Why are some farms doing business in a more sustainable way and others not, and what can be done to encourage transformation from unsustainable to sustainable farming? This thesis analysed farm businesses in Sweden, Norway, Italy and Greece to answer these questions. It compared the business models of these farms to see whether they changed after the farms had adopted principles of sustainability. The results showed that all farms analysed were special in their own individual ways, but they each embarked on a journey of doing things differently with people and the planet in mind. The results also revealed some common factors that initiate change. Farmers in the different countries reported low power in negotiations with large agricultural suppliers, problems with distribution and logistics, and complicated government regulations. However, they also saw opportunities in increasing consumer demands for high-quality and sustainably produced food. The farmers were motivated to stay competitive and saw ways to adapt their products to fill market gaps. An important factor was the set of individual motivations and beliefs that each farmer possessed, although all believed in doing good for the community, animals, soils and the environment in general. Based on this belief, they made changes to the farming business.

As regards changes in actual business activities, all farmers chose to sell their products through short supply chains, where there is direct contact between producer and consumer and where the farmer receives a larger fraction of the product price than in conventional chains with multiple intermediaries. Other reported benefits included meeting customers face-to-face, through which the farmers could build relationships of trust and communication, feel that their work is appreciated and receive regular feedback. The farmers also saved resources on transportation in short supply

chains and had control over their production and distribution. Meat farmers considered it very important to have the highest level of animal welfare possible and this was achieved when the farms transformed their business model to include sustainability.

However, transformation to sustainable farming is not without challenges. Many farmers admitted that they do not know enough about sustainable business and described existing sources of information (e.g. agricultural advisory services) as not entirely helpful. Therefore, learning is an important factor to achieve sustainability. Commitment to sustainability principles also creates certain challenges for farmers, e.g. they may have to select their partners more carefully because they want the entire network to share similar beliefs, which can lead to missed profit opportunities in some situations. This thesis showed that farmers are aware of these challenge and accept them fully.

Overall, the thesis showed that for successful transformation to a sustainable agricultural business, farmers should possess individual beliefs in sustainability supported by structured knowledge on what characterises a sustainable business and how to implement it in practice. All activities in the transformed farm should take into consideration outcomes in the immediate and distant future and effects on all parties involved. In addition, it is essential to have external support from like-minded actors, i.e. the local and national authorities that make laws, major suppliers of agricultural equipment, academics who produce knowledge and consumers who make choices should share the same aspirations for sustainably produced food. Changes at micro-level can then be expanded to global level.

Populärvetenskaplig sammanfattning

Varför vissa gårdar gör affärer på ett mer hållbart sätt och andra inte gör det är oklart. Vad kan vi göra för att uppmuntra omvandlingen till ett hållbart jordbruk? Denna avhandling baseras på studier av lantbruksföretag i Sverige, Norge, Italien och Grekland. Företagens affärsmodell är av speciellt intresse. De empiriska studierna handlar om hur dessa gårdar förändrades efter att gårdarna ägare antog hållbarhet principer. Alla dessa gårdar är unika eftersom de gick på en resa för att göra saker annorlunda med människor och planet i åtanke.

De empiriska studierna pekar på att det finns vissa liknande orsaker som initierar förändring. Lantbrukarna i olika länder upplever begränsad makt i förhandlingar med stora jordbruksleverantörer, problem med distribution och logistik och komplicerade statliga regleringar. Samtidigt ser de möjligheter i förändrat konsumentkraven med ökat intresse för högkvalitativ och hållbart producerad mat. Lantbrukarna är motiverade att vara konkurrenskraftiga och känner förmågan att anpassa sina produkter till det som saknas på marknaden. Vad som är ännu viktigare är de individuella motiv och övertygelser som varje lantbrukare har är att de alla tror på att göra gott för samhället, djuren, marken och miljön i allmänhet. Med denna övertygelse gjordes förändringar i jordbruksverksamheten.

När det gäller förändringar i den faktiska affärsverksamheten valde alla lantbrukare att sälja sina produkter genom korta leveranskedjor, vilket innebär att det finns en direktkontakt mellan producent och konsument. I korta leveranskedjor får en lantbrukare en större del av ett produktpris än i konventionella kedjor med många inblandade aktörer, men det är inte den enda fördelaren. Genom att möta sina kunder ansikte mot ansikte bygger lantbrukare relationer av förtroende och kommunikation, känner att deras arbete uppskattas och får regelbunden feedback. Lantbrukare sparar också

resurser på transporter och har kontroll över sina produktions- och distributionsprocesser. För köttgårdar i studien var det mycket viktigt för ägarna att ha högsta möjliga djurvälstånd. Detta uppnåddes när gårdar omvandlade sina affärsmodeller till att inkludera hållbarhet.

Hållbarhetsarbete är dock inte en process utan utmaningar. Många lantbrukare medger att de inte vet tillräckligt om hållbart företagande och att de befintliga informationskällorna (t.ex. lantbruksrådgivning) inte är helt användbara. Därför är lärande en viktig faktor för att uppnå hållbarhet. Samtidigt skapar engagemang för hållbarhet principer vissa begränsningar för jordbrukarna – de måste välja sina partners mer uppmärksamt eftersom de vill att hela nätverket ska dela liknande övertygelser. I vissa situationer kan det leda till missade vinstmöjligheter. I detta forskningsprojekt identifierades medvetenhet bland lantbrukare om sådana begränsningar och de accepterar dem fullt ut.

Den sammantagna bilden av förutsättningar för ett lantbruksföretag att framgångsrikt arbeta för hållbar utveckling är intimt kopplade till personliga värderingar som återspeglas i kunskap om hur dessa omsätts i strategier och handlingar. Alla aktiviteter i den förvandlade gården bör ta hänsyn till utfall i den närmaste och avlägsna framtiden och effekter på alla inblandade deltagare. Utöver det är stöd från likasinnade aktörer väsentligt och institutionellt stöd från lokala och nationella myndigheter som stiftar lagar, stora leverantörer som säljer jordbruksutrustning, akademiker som producerar kunskap och konsumenter som gör val bör dela samma ambitioner för hållbart producerad mat.

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for me at SLU. Thanks to this support, I travelled to international conferences, completed high-quality PhD courses and shared my work with the international community. Every PhD student, including me, values such chances to expose oneself on the larger scientific stage and feel part of a “bigger picture”. It adds meaning and gives motivation to proceed. Therefore, thank you to all the support functions that exist at every level of this organisation. Keep them going and developing!

A PhD journey is impossible without friends. The best thing I gained while working as a PhD student at SLU was my dearest friends. You know exactly who you are! Thank you for all our conversations through the years, in different periods of our lives and different moods. Sometimes a casual conversation helps and gives more than one could anticipate. I already miss our PhD student community, but I know that we will stay friends through time and distance.

Words cannot express how important my family is to me. Without your limitless support I would not have reached the place where I am now. You have been with me all the time and I know that I can rely on you in my future challenges and achievements. We are the team!

Vera Sadovska, March 2023

Review

Reviewing Value Creation in Agriculture—A Conceptual Analysis and a New Framework

Vera Sadovska ^{1,*}, Lena Ekelund Axelson ¹ and Cecilia Mark-Herbert ² 

¹ Department of Work Science, Business Economics and Environmental Psychology, Swedish University of Agricultural Sciences, 230 53 Alnarp, Sweden; lena.ekelund@slu.se

² Department of Forest Economics, Swedish University of Agricultural Sciences, 750 07 Uppsala, Sweden; cecilia.mark-herbert@slu.se

* Correspondence: vera.sadovska@slu.se; Tel.: +46-4041-5564

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Abstract: Creation of business value is a major objective of any enterprise, but the way in which value is created and its consequences call for re-evaluation in response to current sustainability goals. The agricultural sector serves basic human needs, but its systems and methods for production, processing, and consumption often pose challenges to sustainable development. To address these challenges, this study consolidated value-creating factors identified in a systematic literature review into nine clusters: collaboration, communication, knowledge, production, diversification, entrepreneurship, funding, policies, and inclusiveness. These clusters were analyzed with a Triple Bottom Line framework where financial, environmental, and social dimensions are part of sustainable development. The analysis revealed that agricultural enterprises pursue business activities in a near-term perspective, with few having strategies for long-term activities such as innovativeness, knowledge acquisition, and collaboration with external stakeholders. These findings highlight the complexity in creation of sustainable business value and call for further investigation of how value is conceptualized in the agricultural sector. Re-thinking value creation in the sector should consider why value is created, for whom, the time perspective in which value is assessed, and the aspects given weight in the assessment.

Keywords: added value; collaboration; communication; food production; food processing; innovation; sustainable agriculture; sustainable value; Triple Bottom Line

1. Introduction

Value creation plays a central role for any business system and has been referred to as “the core purpose and central process of economic exchange” [1] and “a central concept in the management and organization literature” [2] (p. 180). The traditional understanding of value in a business context links suppliers, firms, and customers, defining value as customer willingness to pay minus suppliers’ opportunity costs [3–5]. In this classical view, value capture through maximization of a firm’s net present value is the main objective of business activity [6–8].

While creation of business value is the major objective of any firm, the way in which value is created and its consequences require re-evaluation in response to business environment challenges [9]. With the increased importance of environmental and social factors in business, the understanding of value has expanded [10]. Views on the purpose of value creation have shifted from profit maximization to satisfying the needs of a variety of stakeholders now and in future. In other words, ideas of sustainable development have entered the business world. This process has a direct influence on the conceptualization of value and calls for closer examination.

From another perspective, there is a gap in the understanding of context-related aspects of value creation. Value studies assume that value creation happens in the same manner irrespective of the context or the level of analysis, which provides an incomplete picture of value. Thus, there is a need for contextualized research where theoretical conclusions can be applied to a specific context, since the unique features of a context can have a substantial impact on the process of value creation, requiring exploration of meso-levels of analysis that lie between societal and organizational levels [2]. Context-specific studies of value are scarce to date, but can make fruitful contributions to the theoretical understanding of value.

The agricultural sector is one context that has not received the full attention of management research [11], despite its strategic importance worldwide. Agriculture plays a significant role in global and regional development, with the well-being and even survival of many individuals and families being dependent on efficient functioning of agricultural business systems. Therefore, exploration of value-creating activities relevant to the agricultural sector is of urgent need.

Motivated by these issues, the aim of this study was to review the conceptualization of value in agriculture and suggest a new conceptual framework for sustainable value creation. In the first step, value-creating factors in agriculture reported in the scientific literature were identified in a systematic literature review and categorized into groups. Next, the literature review findings were combined with a sustainable development perspective to produce a new conceptual framework for value creation in the agricultural sector, based on the existing sustainable value framework [12]. Areas requiring future research were then assessed.

The rest of the paper is structured as follows: Section 2 provides an overview of the value creation concept in business studies and in sustainability and agriculture perspectives. Section 3 describes the methods used for the systematic literature review and analysis of data. Section 4 presents a descriptive and content analysis of the data, while Section 5 presents the new framework for sustainable value creation in agriculture. Section 6 contains concluding remarks and suggestions for future research.

2. Background

The term ‘value’ appears in business literature with remarkable frequency, but the definitions of the term are rather vague. In product-dominated economic theory, the distinction between exchange value and use value is at the core of value discussions [13]. Exchange value refers to the change in a product in the production process, i.e., the difference between cost and sales price, while use value is a subjective perception of the value of a product or service by a customer.

The value concept has recently attracted a new wave of interest from economics and management scholars [2,14–16]. It is described as something created along the vertical chain of suppliers, firms and buyers, and dependent on the individual characteristics of chain members [17]. In this model, value is created by each member of the chain and, at the same time, each member is interested in capturing as much value as possible. How to capture value becomes the core question for an individual member of the vertical chain, and the way to achieve it is discussed in the business strategy of every firm [17]. Customer value is taken as the balance between the beneficial attributes of a product (e.g., experience, service, brand) and the price [18].

In sum, value perceptions are defined with a narrow group of stakeholders in mind, using primary financial dimensions of value. Applications to other shareholder groups, and creation of value that addresses financial, social, and environmental dimensions are not considered.

2.1. Business Sustainability and Sustainable Value

Firms have practiced business sustainability for many centuries. An example from 17th century Germany describes a forest management approach that accounted for the renewable capacity of the trees [19]. A more modern perspective on business sustainability can be traced back to the 1990s and publication of the Brundtland Report, which enabled businesses to set sustainable development goals in corporate context. The recognition that financial sustainability will not ensure the long-term

prosperity of a firm made a distinction between traditional management theories and a sustainable perspective on management [20,21].

The Triple Bottom Line (TBL) perspective on value creation integrates economic, environmental, and social dimensions of sustainability, and facilitates understanding of their interrelations in multiple ways [10]. TBL is currently perceived as a necessary element of strategy for any firm that aims at integrating sustainability in its business. More recent accounts of value creation present the notion of a broader stakeholder analysis where the business is a part of “creating shared value” [22].

While there is a general agreement that profitability is not a sufficient condition for long-term business success, business sustainability remains challenging. In this study, the assumption was made that firms can work to satisfy all aspects of TBL. Sustainable value implies integration of environmental, social, and financial goals into business, together with multi-stakeholder needs and long-term planning [23].

Sustainable value framework [12] is an instrument that allows value activities to be classified with the purpose of creating sustainable value. It comprises a framework that consists of four segments located along a horizontal axis “Internal-External” and a vertical axis “Today-Tomorrow” [12] (Figure 1).

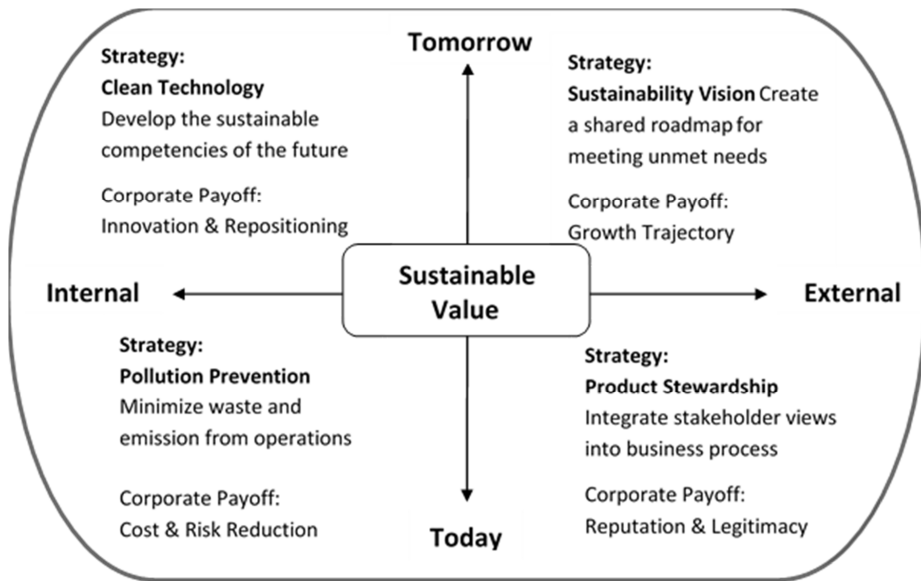


Figure 1. Sustainable value framework adapted from Hart and Milstein [12].

The framework assumes that addressing sustainability challenges is the way to achieve profitability in business while not compromising sustainability goals. By integrating activities that target pollution prevention, product stewardship, sustainability vision, and clean technology into business strategy, companies can reduce risk, improve their reputation, hasten innovations, and focus on qualitative development. In the present study, the sustainable value framework was applied to the agricultural sector to categorize value-creating activities, explain them from the point of view of sustainable development, and suggest future directions for sustainable agriculture.

2.2. Value in Agricultural Business

Agricultural entrepreneurship, innovation, and rural development are all intimately tied to business value creation [24,25]. Discussions about value in the agricultural literature are mostly related

to the specific term of ‘value-added agriculture’. Table 1 summarizes commonly used definitions of ‘value-added’ in the agricultural sector.

Table 1. Review of definitions of the value-added concept in the agricultural sector.

Author	Definition
Amanor-Boadu [26]	Value-adding activity has to satisfy two conditions: (1) if one is rewarded for performing any activity that has traditionally been performed at another stage further down the supply chain; or (2) if one is rewarded for performing an activity that is discovered to be necessary, but has never been performed in the supply chain.
Coltrain et al. [24]	Value-adding is economically adding value to a product by changing its current place, time, and form characteristics to characteristics more preferred in the marketplace.
Ernst and Woods [27]	“Value-added agriculture” is a broad term encompassing many practices that increase the value of farm products. Value-added agriculture has come to describe practices as varied as agri-tourism activities that provide consumers with value from visiting a farm to large-scale processing endeavors that create mass-market retail food products from commodity crops.
Lu and Dudensing [28]	Value-added agriculture is a portfolio of agricultural practices that enable farmers to align with consumer preferences for agricultural or food products with form, space, time, identity, and quality characteristics that are not present in conventionally-produced raw agricultural commodities. Value-added agriculture can be characterized by farmers changing their position in the supply chain, creating closer or direct linkages between themselves and consumers, or changing production processes to alter or preserve certain intrinsic characteristics of their farm/ranch products.
USDA [29]	<p>The agricultural commodity must meet one of the following five value-added methodologies:</p> <ul style="list-style-type: none"> • Has undergone a change in physical state • Was produced in a manner that enhances the value of the agricultural commodity • Is physically segregated in a manner that results in enhancement of the value of the agricultural commodity • Is a source of farm-or ranch-based renewable energy, including E-85 fuel • Is aggregated and marketed as a locally-produced agricultural food product • Is a result of the change in physical state or the manner in which the agricultural commodity was produced, marketed, or segregated <p>The customer base for the agricultural commodity is expanded. A greater portion of the revenue derived from the marketing, processing, or physical segregation of the agricultural commodity is available to the producer of the commodity.</p>
Womach [25]	Value-added refers most generally to manufacturing processes that increase the value of primary agricultural commodities. Value-added agriculture may also refer to increasing the economic value of a commodity through particular production processes, e.g., organic produce, or through regionally-branded products that increase consumer appeal and willingness to pay a premium over similar but undifferentiated products.

All aspects of the value-added defined in Table 1 refer to the product as the source of value creation or a producer as the beneficiary of value. In addition, value itself is examined mostly from a financial perspective. Referring to the TBL, we see a need to view value creation based on a systems perspective, taking a broader view on sustainable agriculture.

3. Methods

A systematic literature review was applied in a structured evaluation of published academic work. The review objectives were to systematically access and interpret the existing body of literature and suggest areas for future development of knowledge [30,31]. With the help of a literature review, knowledge gaps can be identified, contributing to theory development [32].

The term ‘value’ comprises numerous meanings and is used by researchers in numerous ways. Here, the interest was in a specific understanding of value in terms of business activities in the agricultural sector, and therefore, strict selection requirements were set for the initial pool of articles. The systematic literature review performed was based on a keyword search following the PRISMA-P protocol [33] to ensure a structured and comprehensive procedure. A successful search strategy requires awareness in determining the search terms and identifying relevant papers [34]. The choices made in this study in terms of search queries are described in Table 2. Databases, Thomson Reuter’s Web of Science Core Collection, and Elsevier’s Scopus were used to conduct the search. The search terms consisted of “value” and its derivatives, together with “agriculture” or “farming” or “horticulture”. The document type was “article”, language “English”, and subject areas limited to business or management. The search was based on titles, abstracts, and keywords.

Table 2. Databases and terms used in the search queries in this study, and number of hits obtained.

Database	Search Query	No. of Results
Scopus	TITLE-ABS-KEY (agro* OR agri* OR farm* OR agrar* OR horti*) AND TITLE-ABS-KEY ((value W/2 creat*) OR (value W/2 captur*))	135
Web of Science Core Collection	TS=(value near/2 creat*) or (value near/2 captur*) AND TS=(agro* or agri* or farm* or agrar* or horti*)	61

Boolean modifier the asterisk, *, searches for any word that begins with the stem of the word truncated by it.

The limitations of pre-defined search terms are that only articles that use the same vocabulary can be retrieved. The search terms used here were taken from the business administration literature, so articles in other disciplines that use different terms to describe the same concept would not appear in the search. By applying filters and after elimination of duplicates in the original database of 196 articles (135 from Scopus together with 61 from Web of Science), the remaining 173 articles were assessed manually by reading the title and abstract. The procedure is described in Figure 2.

Following the procedure, the original database was reduced to 121 articles, which were analyzed in depth by assessing the full text. Finally, the list was reduced by 13 articles to form the final set of 108 articles. The inclusion criterion were that an article should have any kind of agriculture or food production as the main topic. The exclusion criterion excluded articles where agriculture was not the main focus; articles not written from a business perspective; and articles not reporting added value as a result of certain activities.

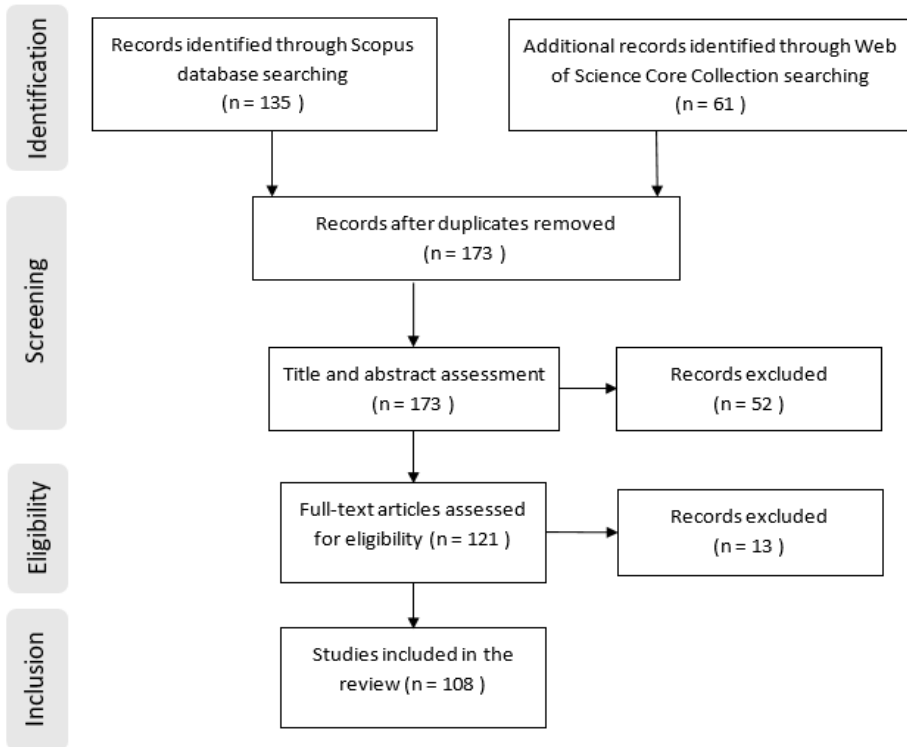


Figure 2. PRISMA 2009 flow diagram of stages followed in the systematic literature review.

In the next stage, descriptive and content analysis was performed to identify the value-creating factors in the selected papers. This is done by the process of reducing the textual data by theme identification and frequency analysis [35]. Due to the broadness of the value concept, different terms in the literature are sometimes used to represent similar value-creating activities. With the help of the content analysis, it was possible to consolidate these activities into clusters based on relevance, providing a more concise classification of results.

4. Results

The papers reviewed applied a variety of methodological approaches to data collection and analysis. About half involved case studies, some of which were longitudinal [36,37]. Others used survey data [38,39], and a small proportion of articles employed observation and participatory methods [40,41]. Data analysis methods included statistical methods, economic modeling, and a meta-analysis [42]. Figure 3 shows the trend in publication numbers over the period 1995–2018.

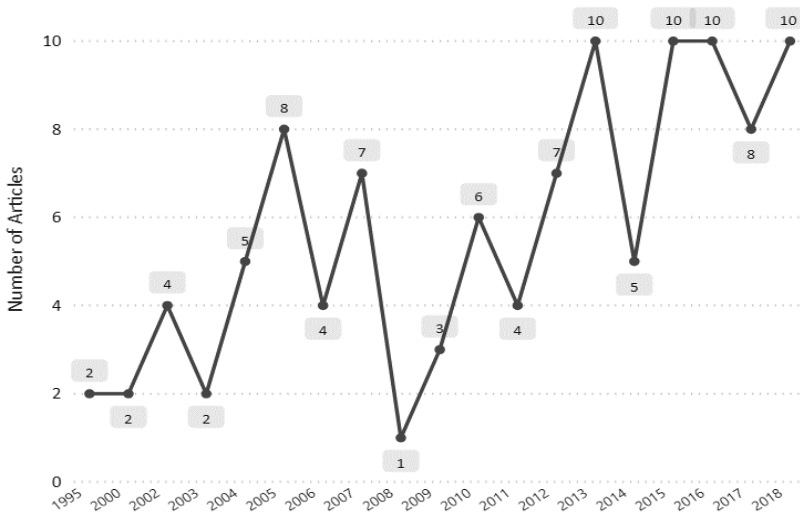


Figure 3. Number of publications on value creation in agriculture produced annually in the period 1995–2018.

Although the database search had an open start date, the oldest retrieved publication was dated 1995. The explanation might be that other terms to describe the concept were used earlier (e.g., “value addition” instead of “value creation”). There was a clear increase in the number of publications over time (Figure 3).

4.1. Content Analysis

Analysis of the articles enabled identification of 23 distinct value-creating factors mentioned in the literature (Figure 4). The order in which factors are listed in the figure corresponds to the frequency of indications in articles (i.e., factor 1 on the list was mentioned most often).

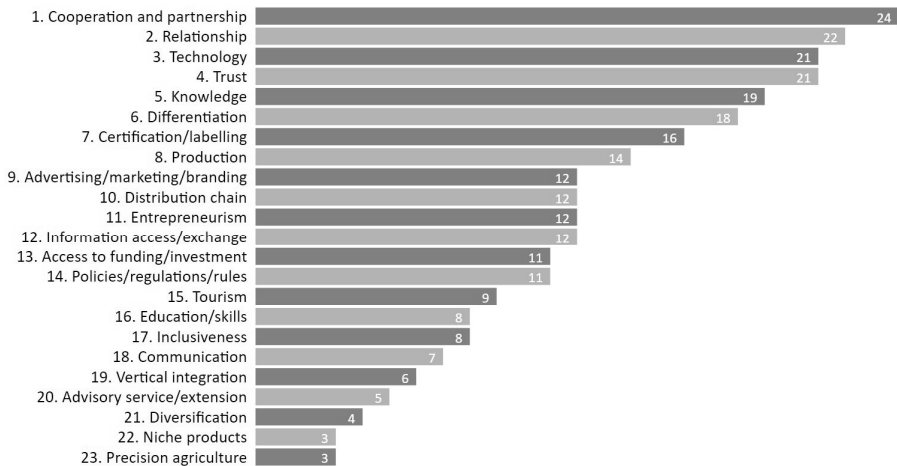


Figure 4. Value-creating factors (23) mentioned in the set of 108 articles reviewed. Number of mentions of factors indicated on bars.

In total, 278 indications of different value-creating factors were found in the sample of 108 articles. Figure 5 presents the papers with the indication of the factors mentioned in these 108 articles.

No	Sources	Year	Factors	No	Sources	Year	Factors
1	Anic and Nusinovic [43]	2005	3, 8, 13, 14	55	Jolink and Niesten [93]	2015	6, 7, 11
2	Armstrong et al. [39]	2005	6, 9, 18	56	Kaaristo [94]	2014	11, 15
3	Atănaşoae [44]	2011	2, 6, 10	57	Kastelli et al. [95]	2018	3, 14
4	Austin and Leonard [45]	2008	1, 17, 18	58	Katz and Boland [96]	2002	1, 8, 12, 22
5	Badar et al. [46]	2015	7, 9	59	Kline et al. [97]	2017	4, 6, 15, 16, 22
6	Baron, 2011 [47]	2011	4, 6	60	Leguizamon et al. [98]	2016	1, 2, 6
7	Batterink et al. [48]	2010	1, 13, 20	61	Liang [99]	2017	5, 11, 15
8	Bertazzoli et al. [49]	2011	1, 10	62	London et al. [100]	2010	4, 13
9	Bogale et al. [51]	2018	8, 9, 10	63	Lutkemeyer Filho et al. [101]	2015	2, 4, 20
10	Boehlje [50]	2004	3, 8	64	Marotta et al. [102]	2017	2, 4
11	Boland [52]	2003	3	65	Matopoulos et al. [103]	2007	1
12	Bongiovanni and Lowenberg-Deboer [53]	2004	3, 5, 23	66	McBratney et al. [104]	2005	3, 5, 23
13	Bonney et al. [54]	2013	11, 17	67	Melton and Huffman [105]	1995	3, 19
14	Briscoe and Ward [56]	2006	1, 11, 21	68	Mishra et al. [106]	2009	8, 13, 16
15	Bramley and Kirsten [55]	2007	6, 7	69	Moeen and Agarwal [107]	2017	3, 5
16	Bryla [57]	2017	7, 10	70	Menozi [108]	2014	5, 7, 12, 14
17	Campbell and Doherty [58]	2013	5, 22	71	Meissner and Komba [109]	2012	4, 6, 11, 19
18	Carrquiry and Babcock [59]	2007	4, 7	72	MK Leat and Revoredo-Giha [110]	2013	1, 4, 6, 7
19	Che [60]	2006	9, 15, 21	73	Migliore et al. [111]	2015	9, 10
20	Chen and Tang [61]	2015	12, 23	74	Micheels and Gow [112]	2009	3, 4, 5, 6, 8
21	Chumaidiyah [62]	2017	6, 8	75	Montealegre et al. [113]	2007	3
22	Cloesen [63]	2007	11, 15, 21	76	Moulton and Zwane [114]	2005	11, 14
23	Cucagna and Goldsmith [64]	2018	2, 6, 8	77	Munjal et al. [115]	2016	4, 6, 7, 15, 19
24	Darrocho et al. [65]	2002	2, 6	78	Neganova [116]	2010	9, 16
25	Dentoni et al. [66]	2012	2, 18	79	Nettle et al. [37]	2013	12, 20
26	de Carvalho and Mendes [67]	2016	8, 10	80	Pannekoek et al. [117]	2005	1, 11, 18
27	Declerck and Cloutier [68]	2010	3, 7	81	Pant et al. [118]	2012	8, 16, 17
28	Deselnicu et al. [42]	2013	7	82	Pascucci and Magstris [119]	2013	5, 12
29	Dey et al. [69]	2016	3, 5, 15, 16, 17, 18	83	Patel [120]	2014	1, 10
30	Di Gregorio [70]	2017	6, 11, 15	84	Pennings [121]	2010	9, 13
31	Duffy and Fearnle [71]	2004	1, 2	85	Peterson [122]	2013	1, 3, 5
32	Eastwood et al. [36]	2012	2, 3, 5, 20	86	Polo Redondo and Cambra Fierro [123]	2007	2, 4
33	Fafchamps and Minten [72]	2002	2, 12	87	Poniman et al. [124]	2015	1, 4, 7
34	Ferraz et al. [73]	2018	4, 5, 18	88	Ramesh [125]	2010	2, 11, 17
35	Giannakis and Bruggeman [74]	2015	5, 13, 14	89	Ruslan et al. [126]	2013	5, 8, 9, 13, 14
36	Gloy and Akridge [75]	2000	3, 5	90	Safrir [127]	2015	11, 17
37	Gray et al. [76]	2004	5, 13	91	Shah and Ghazzawi [128]	2012	8, 21
38	Goldsmith and Bender [77]	2004	2, 6, 12	92	Semenda et al. [129]	2018	14
39	Goldsmith and Gow [78]	2005	6, 19	93	Sexton et al. [130]	2007	19
40	Grunert et al. [79]	2005	2, 9, 12, 14	94	Shieh and Hu [131]	2016	1, 5, 16,
41	Hall [80]	2005	3	95	Sturaro et al. [132]	2013	7, 8, 11, 14,
42	Hsu et al. [81]	2013	1, 15	96	Sturiale and Scuderi [133]	2016	3, 12,
43	Han and Chuang [82]	2015	1, 4, 16, 17	97	Sogn-Grundvag et al. [41]	2014	7
44	Handayati et al. [83]	2015	1, 10, 18	98	Starr et al. [134]	2003	9, 10
45	Hartlieb and Jones [84]	2009	4, 7	99	Tampe [135]	2018	2, 7, 19
46	Hastings et al. [85]	2016	2, 4, 10	100	Tang et al. [136]	2016	1, 2, 4
47	Higgins and Laredo [40]	2006	5, 12	101	Teklehaimanot et al. [137]	2017	5, 12, 16
48	Hinrichs [86]	2000	2, 10	102	Tencati and Zsolnai [138]	2012	1, 4, 8
49	Hinterhuber [87]	2002	1, 20	103	Thilmany et al. [38]	2006	7
50	Howieson et al. [88]	2016	1, 2, 3	104	Thomas-Francois et al. [139]	2018	2, 11
51	Hunt et al. [89]	2012	2, 4, 9	105	Tzouramani et al. [140]	2011	6, 13, 14
52	Jayashankar et al., (A) [90]	2018	3, 4	106	Uzea and Fulton [141]	2014	1, 2, 9
53	Jayashankar et al., (B) [91]	2018	3, 4	107	Woiceshyn [142]	1995	3, 12, 13
54	Jraisat [92]	2016	1, 10, 17	108	Zavorotin et al. [143]	2018	13, 14

Figure 5. Papers in which value-creating factors 1–23 were mentioned [43–143].

Analysis of the frequency of mention of different terms revealed that cooperation and partnership factor occurred most often in the literature, mentioned in 24 of 108 sources, followed by relationship (22/108) and technology (21/108) (Figure 5). The least frequently mentioned factors were niche products and precision agriculture (both 3/108) (Figure 5). Frequency of mention does not necessarily reflect the

significance of a factor, since it can be affected by the time at which a factor first appears in the literature. Thus, the present frequency analysis did not reveal the importance of certain factors over others, but showed that some factors are more commonly discussed in the agricultural business community.

Some of the 23 factors refer to similar contexts or closely related concepts. To improve the accuracy of results and efficiency of analysis, the number of variables had to be reduced [144]. Therefore, the value-creating factors were analyzed based on thematic similarity and similar concepts were united into clusters. Following this, the 23 factors were consolidated into 9 clusters (Figure 6): collaboration, communication, diversification, knowledge, production, entrepreneurship, funding, inclusiveness, and policies. Although some factors were interconnected and could be assigned to several clusters, they were placed in the most relevant cluster. Each cluster is further described in Sections 4.1.1–4.1.9.

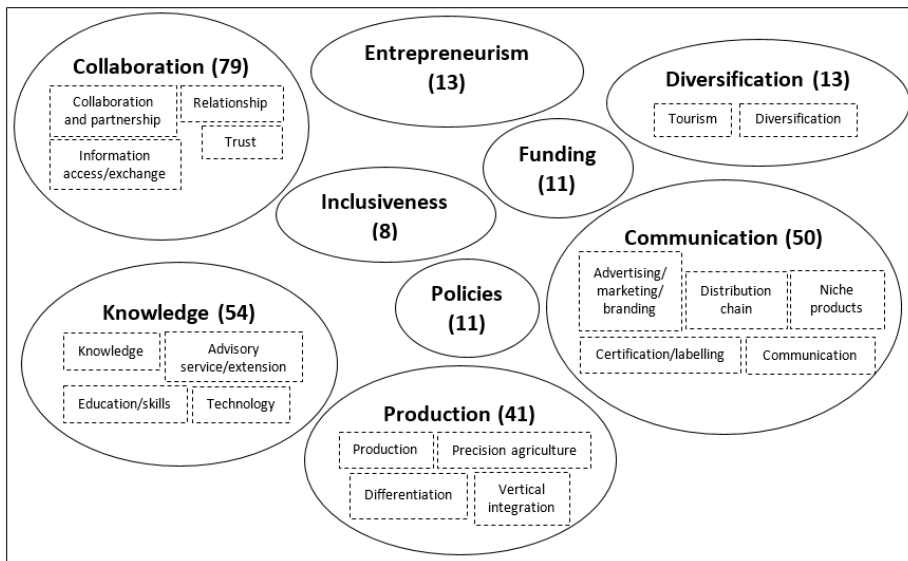


Figure 6. Nine clusters of value-creating factors identified in the agricultural business literature (number of mentions of component factors in brackets).

4.1.1. Collaboration

The collaboration cluster included all kinds of partnerships and relationships in agricultural enterprises. It also encompassed topics such as trust and information access. Collaboration occurs at all levels of the value chain, with practical examples being knowledge exchange, common use of processing, testing, and R&D facilities, etc. Collaboration also appears in the form of farmers' federations and established joint ventures. Formal organizations can act as promoters of certain trends such as encouraging organic production, certification of products or development of new sales channels, and joint purchasing of inputs. In the example of dairy cooperatives in Ireland, collaboration with outsourcing partners is used to optimize business activities [56]. Small-scale cooperatives cooperate in collective use of testing, processing, and storage facilities [85]. This allows farmers to avoid investments in higher capacity facilities. Farmers also collaborate informally on EU milk quotas by transferring quotas between cooperatives.

4.1.2. Diversification

According to the literature reviewed here, farmers can achieve financial sustainability in their business and increase their own well-being through diversification. The articles mentioned agriculture-

or non-agriculture-related diversification. Examples of agriculture-related diversifying activities are growing vegetables for sale by dairy farmers [56] and production of feed for sale by meat farmers. Examples of non-agriculture diversification are selling or lending land to another business, building non-agricultural facilities on own land [139], and opening (eco-) tourism on the farm [63,94]. Establishing a rural tourism venue was a commonly suggested way to diversify the agricultural business, as it can provide additional income [63], lead to the purchase of agricultural products [99], and also stimulate rural development [81] and protect environmental resources [139].

4.1.3. Communication

Communication refers to the way in which a company presents itself to clients, partners, and employees. An agricultural company communicates through its marketing strategy and the identity of its products. Product identity relates to activities such as certification, labeling, and branding. Certification and labeling are closely related and certification often leads to a label on a product. The purpose of certification is to ensure the safety and traceability of agricultural products from producer to consumer, which enhances consumer confidence and trust, and enables the creation of value-creating services for a producer. One study [58] reported a link between certification and economic benefits for the producer. The motivation behind labeling has two sides, economic and idealistic [84]. Evidence suggests that customers are attracted by different claims made by labels, such as “no antibiotics”, “no hormones”, or “humane treatment” [38]. In one study, almost 65% of survey respondents were ready to pay a price premium for health benefits offered by health-enhancing dairy products [39]. Labeling schemes such as Geographic Indicators have led to price premiums, though the level varies for different categories of products [42].

Communication with partners along the distribution chain plays an important role for the business. The distribution chain comprises: direct (sales direct from the farm), short-distance (including farmers’ markets, specialist organic stores, home delivery, restaurants), and traditional (deliveries to supermarkets or wholesalers, or through cooperatives). [44]. Direct and short-distance supply chains are associated with a positive effect on the local economy and increased trust among consumers [111]. In addition, a short distribution chain provides the possibility to obtain a price premium in niche markets [134].

4.1.4. Knowledge

Agricultural knowledge is embodied in multiple activities of an agricultural enterprise, including the emergence of new technologies for products or processes [80,118]. Education and the development of skills, together with knowledge transfer through advisory services, emerged as topics throughout the literature reviewed. An assessment of the economic performance of the agricultural sector in 27 EU member states demonstrated that a better educated and trained farm population achieved almost nine-fold better economic performance [74]. A written business plan, a higher number of decision-makers, and engagement in value-added agriculture were reported to have a positive effect on the financial performance of new farm businesses [106]. Decision support systems (DSS) can be used to automatize farm tasks and manage large, complex businesses in order to improve control and optimize farm performance [36]. According to the study, core competencies necessary for successful implementation of DSS are:

- Information technology skills—a farmer requires at least a basic understanding of IT
- Engagement—farmers should actively engage with the system, e.g., in order to see new opportunities that individual animal data can provide
- Knowledge exchange—information about the system should flow between users and system database

The program team approach enables communication and knowledge sharing between groups of researchers, public and private organizations, farmers, the community, extension services, policy

makers, and service groups [37]. Extension services from an innovation broker bring value for development of innovation networks. With the support of a broker, a farm gains access to knowledge at the inter-organizational level [48].

4.1.5. Production

The value-creating factors incorporated in the production cluster were mentioned in 41 articles (Figure 5). They included different production techniques (e.g., precision agriculture), differentiation strategies, and a general indication of the importance of production efficiency for value creation. Creating value in production brings higher returns on investment. Labor optimization through a decrease in the number of harvesting groups and increase in the hours per machine brings a net cost reduction [40].

Precision agriculture is a way to create economic and environmental value [145]. It allows chemicals to be used more efficiently, providing cost minimization and environmental protection [53]. However, for precision agriculture to advance, it requires development of DSS [104].

The literature reviewed highlighted the importance of vertical integration of smallholders to processing firms. A study of the beef and pork industry in the USA [105] noted that top-down vertical integration is an important factor for the success of producers. Moreover, vertical integration into food processing and further down the value chain can capture a larger share of "food dollars" by agricultural enterprises [130].

4.1.6. Funding

Access to funding and investments is crucial for development of agricultural enterprises, as the capital intensity of the sector requires major initial financial inputs. Low-cost and safe financing sources stimulate innovativeness and increase knowledge adsorptive capacity in the sector [48]. Government support is important because of the high level of risks [126]. The competitiveness of the sector is constrained in the absence of government funding and unfavorable conditions for acquiring funding from other sources, like commercial banks. Access to working and intellectual capital depends on affordable and low-risk credit [100]. Consequently, countries that invest in their agricultural sector and create a favorable financial environment tend to have high-performing and competitive agricultural businesses [74] that are able to overcome constraints with the help of investments [100].

4.1.7. Policies

Policies appeared in 11 articles as a factor contributing to value creation. Policies usually have influence beyond an individual agricultural enterprise, affecting the whole sector locally or internationally. In the European context, some farmers have stayed in business thanks to the income support payments provided under the EU common agricultural policy, which also aims to improve quality of life in rural areas [74]. A study on the apple processing industry showed that government engagement in a transparent agricultural policy has had a positive effect on infrastructure, technology, and cooperative arrangements [43]. Special policies targeting Geographic Indicators (GI) can promote long-term economic success and rural development by creation of favorable conditions for GI-marked products [108]. In addition, the market orientation of agricultural producers and the whole value chain can be enhanced by corresponding regulations [79]. Aside from formal regulations, voluntary agreements provide support for policy implementation. By stimulating interest groups in the industry, the government manages risk better, and with lower costs [114].

4.1.8. Entrepreneurism

Entrepreneurism in the agricultural sector refers to the opportunities to “create a more efficient and effective agricultural system” [54] (p. 2) by using resources in creative ways. Large corporations often limit the choices of smaller actors in the sector. In contrast, a high level of entrepreneurism is linked to the financial success of small players, along with their ability to compete with larger enterprises [56]. Agricultural entrepreneurs also create value as mediators between the environment and customers in the area of rural tourism [94], and in the main agricultural business activities [93]. The image of local embeddedness created by entrepreneurs in relation to their business is reported to be another source of value creation [70].

4.1.9. Inclusiveness

Inclusiveness in the agricultural business means consideration of the interests of smallholders, large commercial business entities, communities, and society as a whole. In the literature reviewed here, inclusiveness was often studied in relation to the low-income context, aiming to create value and empower local communities and small agricultural enterprises. The presence of cooperation and partnership is reported to be a prerequisite for inclusiveness [118,131]. Creation of value can be achieved by different aspects of inclusiveness. Local embeddedness of an enterprise contributes to long-term value creation for the benefit of multiple stakeholders by lowering adaptation costs [82]. Inclusive networks of agricultural enterprises have a positive impact on business performance [92]. In the African context, inclusive supply chains led to transformation of smallholders into commercially-oriented enterprises enhancing rural development and improving food security in the region [137].

5. A New Framework for Sustainable Value Creation in Agriculture

The value-creating business activities identified in the agricultural sector literature review were associated in different papers with organizational aspects (collaboration, inclusiveness, funding), concept orientation (diversification), marketing (communication), macroenvironment (policies), skills (knowledge and entrepreneurism) and technology (production) (Figure 6). This section builds on existing activities to move towards sustainable value creation and to re-think it in light of long-term perspective and circularity.

Re-thinking Value Creation

The new framework for sustainable value creation in agriculture builds on the nine clusters of value-creating factors previously identified in the agricultural business literature. To take a step further, these previously identified clusters are interpreted from a sustainability perspective. Specifically, what was earlier perceived as a one-dimensional value creating activity (e.g., production) is translated into Triple Bottom Line value where environmental and social dimensions are as important as the financial dimension. Moreover, the new framework incorporates additional concepts that specifically target the sustainability of the sector (Figure 7). The choice of the additional concepts is partly guided by Hart and Milstein [12] in combination with very recent studies [146–150] and the authors’ own experience. This integration of earlier identified and new concepts aims to connect value and sustainability in agriculture.

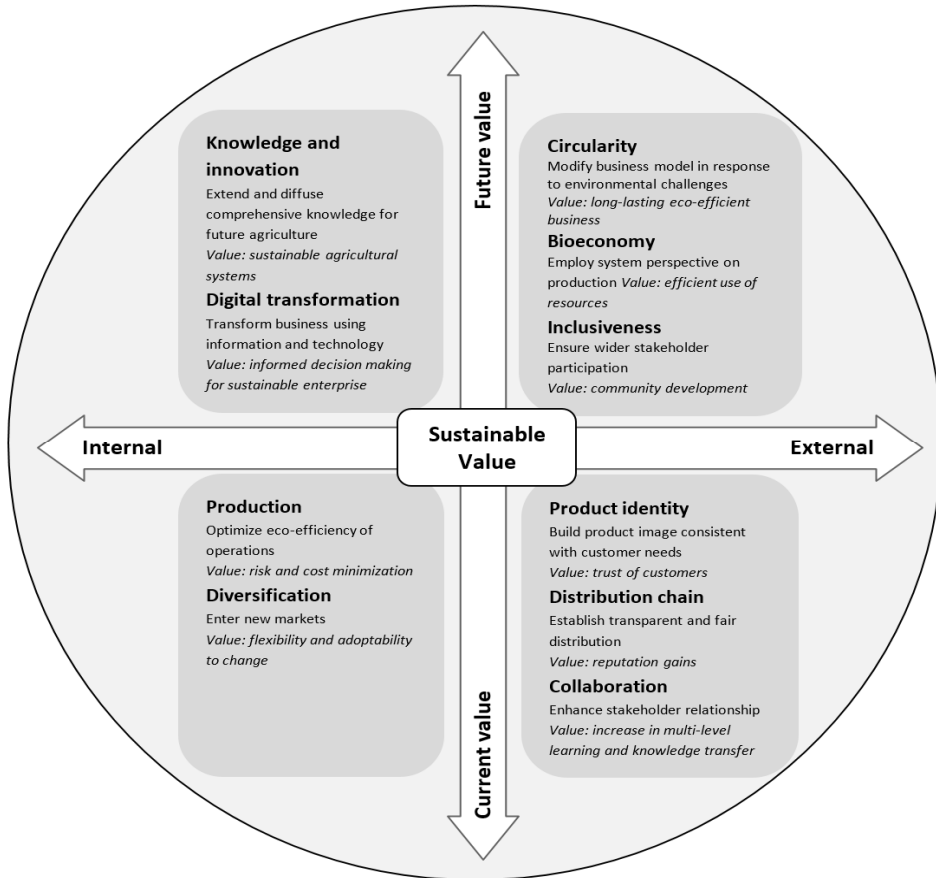


Figure 7. New framework for sustainable value creation in the agricultural sector.

In the new framework for the agricultural sector, the vertical axis “Current value—Future value” represents the connection between activities addressing value of today and perspectives for the future value. The horizontal axis “Internal—External” reflects the need to maintain internal value activities and interactions with the external surroundings simultaneously.

The lower-left segment of the framework encompasses production and diversification, both activities conducted internally inside the organization. They focus on managing current business resources allowing for cost reduction and risk minimization. These types of activities are common for the agricultural sector and a large number of scientific articles provide proof of their successful application in business. The new framework suggests extending the understanding of efficient production by including environmental and social impacts as an inherent part of efficient production. A relationship between farm value and climate change has been reported, where more land will become unsuitable for farming after the climate warms above the certain temperature [151]. Thus, accounting for environmental impact provides grounds for risk management and cost minimization in conditions of uncertainty due to global environmental challenges. The social side of risk minimization includes increased work safety and resilient livelihood of the rural population [152,153]. Therefore, a sustainable value of risk and cost minimization is not only limited to financial gains for the producer, but also comprises mitigation of environmental damage and improved social conditions. Besides,

value is intimately connected to the context in which production and consumption take place. In the eyes of the consumer, value may include environmental impact of a product, social standards of production, price, etc. Hence, by perceiving risk in a sustainable value perspective, producers can meet broader consumer interests.

In contrast to the traditional value of diversification (more opportunities for financial returns), the new framework calls for a broader understanding of diversification that aims for socioeconomic efficiency and community development. This resonates with eco-efficient production, as it results in flexible and adaptable business entities more prepared for changes arising in environmental and social domains.

In the existing sustainable value framework (Figure 1), the lower-right segment includes a product stewardship strategy, which is achieved by integrating external stakeholders' opinions. The new framework develops and contextualizes the original idea by suggesting integration of additional elements into this segment. Product identity, distribution chain, and collaboration activities take place in this segment of the framework. They are related to external stakeholders of a firm (e.g., suppliers, customers, and media) and are associated with the short-term business horizon. By working with product identity, agricultural enterprises interact with customers to recognize their needs and gain trust by creating socially and environmentally safe and reliable products. The TBL perspective on the distribution chain targets integration of transparency and fairness into all links of a chain, and promotes transformation from linear distribution to an interconnected network of partners. Fulfilment of these conditions results in value gains of a steady and solid reputation reflected in products and corporate branding. Facilitating collaboration is a new path for sustainable value creation [12]. The articles reviewed here gave examples of collaborations between agricultural enterprises with the purpose of joint use of production facilities, storage space, or conducting R&D activities. The articles did not provide evidence of explicit inclusive dialog between firms and stakeholders. Thus, although collaboration exists in the sector, it is unclear how organizational arrangements influence sustainable development. The view on collaboration expressed in the new framework points to the need for enhancing relationships with stakeholders. By consolidating collaborations, an agricultural enterprise can complement its knowledge on multiple levels and convey this knowledge further.

The top level of the new framework consists of activities that are oriented to the future value horizon. The upper-left segment in the new framework encompasses knowledge and innovations together with digital transformation. The importance of disruptive innovations in the agricultural value chain have been emphasized in the literature [154]. This corresponds to the statement that creation of value for a firm is dependent on its ability to “creatively destroy its current capabilities in favor of the innovations of tomorrow” [12]. Between the dimensions ‘Internal’ and ‘Future value’ in the new framework, knowledge and innovation activities take a prominent position and are considered not only as a source of value, but also as a prerequisite for value-creating activities in other dimensions of the framework. Problems with knowledge transfer are among the reasons for slow progress with the environmental dimension of sustainability [155]. As agricultural production interacts with the environment, knowledge of ecosystems management promises to be beneficial for the future of the sector. Efficient production and environmental balance can be achieved by having knowledge of ecosystems [156]. Further knowledge spread through education has a positive impact on innovativeness [157]. While innovativeness stimulates business performance [158], in the context of sustainable value, innovations should strive for solutions in environmental and social domains. Digital transformation is interconnected with knowledge and innovation, as it implies business transformation based on information and technology which results in informed decisions for the responsible enterprise.

Circularity, bioeconomy, and inclusiveness are value-creating activities in the upper-right segment of the new framework. Agricultural value creation has been discussed historically in terms of supply chains and value chains with linear understandings. Future needs for sustainable food systems call for new models that are circular and connect resources between production and consumption. The TBL perspective may offer grounds for understanding all three dimensions of value, which in turn calls

for new business models [159]. These perspectives replace the end-of-life concepts with restoration, assume collaboration and knowledge, and put emphasis on smart design. The new framework develops the original idea of this dimension (sustainability vision) by suggesting bioeconomy as a vision for agriculture. Bioeconomy emerged as a response to global environmental challenges. It aims at the systemic transformation of manufacturing by promoting renewable resources [160]. Bioeconomy perspective adopted by an agricultural enterprise enables the creation of long-term value for people and the planet.

Inclusiveness as a suggestion for sustainable value-creating activity points to the need for wider stakeholder participation in decision-making processes. In different parts of the world, certain groups and communities did not have a voice in activities related to agricultural recourses for decades. Such conditions do not conform to the new vision of value, and call for a change to accommodate a comprehensive representation of stakeholders.

6. Conclusions

This study presents a new sustainable value creation framework for the agricultural sector. This framework allows examination of an agricultural enterprise in different dimensions regarding its activities for creation of sustainable business value. Analysis of literature identified 23 factors reported to govern value creation by agricultural enterprises. These factors were aggregated into nine clusters: collaboration, knowledge, communication, production, diversification, entrepreneurship, funding, policies, and inclusiveness. Using these clusters of activities as a basis, a conceptual view on value creation in the context of the agricultural sector was developed. The overall conclusion from analysis of the literature was that the conceptualization of value in scientific articles is mostly one-dimensional, with a focus on financial benefits for enterprises, while disregarding the environmental and social aspects of TBL. The focus on financial benefits also involves a narrow stakeholder definition.

Re-thinking value creation in agricultural enterprises by considering all three aspects of TBL in balance is the way forward for future scientific work. This will mean questioning why value is created, for whom, the time perspective in which value is assessed, and the type of value given weight in the assessment. This will require the stakeholder definition to be widened to embrace the notion of shared value creation—something that other studies can explore. Future research should investigate business models that ensure collaboration, innovation, consumer inclusion, and knowledge transfer models for creating sustainable value. Longitudinal studies can be effective in investigating the change in enterprises that adopt a sustainable value paradigm. Finally, the linear perspective on value creation needs to be replaced with a circular perspective by focusing on the interaction between internal and external drivers for collaboration as part of a circular economy. Circularity offers a resource-based understanding of sustainable value creation using renewable resources and extending the use of non-renewable resources. Future research can benefit from a deeper understanding of how circularity contributes to value in a TBL perspective.

The results in this study have practical implications for managers and advisors in the agricultural sector, which corresponds to the recently published articles. For example, there is an indication that knowledge sharing allows for better managerial decisions for agricultural territory planning [161]; circular approach to agricultural residuals promise environmental benefits and financial gains [162]; and digital technology leads to enhanced value co-creation [163]. At the same time, many problems remain unsolved, such as lack of inclusiveness in global value chains [164,165] or collaboration with farmers at the bottom of the pyramid [166].

This study provides comprehensive coverage of value-creating activities at farm level reported in the literature. It also suggests different activities that can move an agricultural enterprise towards sustainability in all three aspects of TBL. By adopting the new framework, advisors can communicate knowledge on sustainable value creation for agriculture through education and farmers can integrate sustainability into their value creating strategy.

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Sustainable value creation – a farm case on business model innovation

CASE STUDY

Fredrik Fernqvist[Ⓐ], Vera Sadovska^ᵇ and Per-Anders Langendahl^ᶜ

^ᵃSenior Lecturer, ^ᵇPhD Student, Department of People and Society, Swedish University of Agricultural Sciences, P.O. Box 190, 234 22 Lomma, Sweden

^ᶜSenior Lecturer, Department of Economics, Swedish University of Agricultural Sciences, P.O. Box 7013, 750 07 Uppsala, Sweden

Abstract

The agricultural sector in Sweden, as elsewhere, is affected by increased intensification and specialisation, leading to fewer and larger farms. The majority of agricultural firms acquire profits by pushing an economies of scale strategy, which is not always possible for small farms. However, there are alternative strategies. This teaching case focuses on a small farm in Sweden and offers students an opportunity to study the management of business model innovation in this context. The case explores the value creation strategy of a cattle farm and applies activities such as mapping a business model, developing suggestions for business model innovation, analysing existing and lacking managerial competences and pinpointing implications for agricultural policy. As a result, profitability, competitiveness and sustainability of the study farm should be achieved, together with acquisition of knowledge and skills by its owner. This educational case is suitable for agricultural students of different levels requiring knowledge of business and management.

Keywords: agribusiness, business model, strategy, competencies, management

JEL code: M14, M31, O30, Q13

[Ⓐ]Corresponding author: fredrik.fernqvist@slu.se

A teaching note has been prepared for this case study. Interested instructors at educational institutions may request the teaching note by contacting the author or IFAMA.

1. Introduction

Agriculture is of particular research interest given its environmental impacts and societal importance. Primary production and related activities make significant contributions to human health and economic growth, but also cause environmental impacts such as natural resource depletion and climate change (e.g. Campos, 2021; IPCC, 2021). Thus, development and uptake of more sustainable agricultural practices are needed.

At firm level, the majority of agri-food companies are primary producers driven by a resource efficiency logic that emphasises increasing production with fewer resources, complying with the economies of scale logic (Ulvenblad *et al.*, 2019). Hence, the agricultural sector has a strong production focus, with knowledge and innovations focusing on production-related issues rather than market developments (Spendrup and Fernqvist, 2019). Consequently, many agri-food companies focus on low-cost production to maintain profitability, which prevents them from developing more robust sustainable practices (Dobermann and Nelson, 2013; Ulvenblad, 2021; Ulvenblad *et al.*, 2016).

It is increasingly recognised that firms need to find ways to influence their revenue streams by getting more revenue per unit produced (Ulvenblad *et al.*, 2018). Agri-food companies need to take a more strategic and innovative perspective on value creation that enables them to enhance their profitability and contribute to a more sustainable agri-food sector. A central matter for those farmers seeking to renew their businesses is to develop knowledge and competences in areas such as management, marketing and strategic decision making.

This teaching case describes a Swedish agricultural firm going through the process of changing its business model. From having been a typical commodity producer of beef, the owner is now focusing on added value strategies, sustainability practices and new sales channels to improve the firm's competitiveness and create long-term business value. The case provides practical knowledge on business model innovation and illustrates the complexity in strategic, managerial decision making in small agricultural firms. In a broader perspective, it also pinpoints implications for agricultural policy. Food production in Sweden is recognised for its high standards of food safety, environmental protection and animal welfare, but also for challenges of low profitability in agri-food enterprises (OECD, 2018). This study case on a Swedish agricultural firm can therefore be relevant for students and practitioners in other countries. Specifically, the case draws on recent conceptual developments from business studies and innovation, which are applied to assist students and practitioners in exploring decision making challenges and to reveal opportunities for developing more sustainable value creation strategies in agri-business.

1.1 Business model innovation and value creation

There are numerous definitions and typologies of business models (BM). According to more recent and comprehensive definitions, BM are key business processes and structures of a firm that create value (Zott *et al.*, 2011), while allowing identification of unmet customer needs by characterising ways to address these (Teece, 2018). In other words, a BM describes value creation, delivery and capture by a firm, and firm architecture enabling this. A BM includes the activities undertaken by firms to create value, deliver value to market and capture (financial) value in return (Boons and Lüdeke-Freund, 2013). Business model innovation (BMI) refers to a change from one BM to another. For instance, a farm that is shifting its focus from cost cutting to new forms of value creation (e.g. added value) must rethink its BM and identify opportunities for BMI.

In the context of BM, achievement of competitive advantage by a firm is a leading driver. For this reason, many BM-related studies have explored innovations as a way to improve a business' and succeed in the market. As a result, BMI has become a prominent topic and it is proposed that BM can be innovated in three ways (Zott and Amit, 2010):

- by including new activities;
- by connecting activities in new ways;
- by replacing an actor who performs an activity.

The process of BMI can exemplify itself in either new models designed for a new organisation or in the reconfiguration of existing models. In a latter case, BMI involves challenges for a firm in terms of changes to internal organisational structure, managerial processes and external supply network (Mitchell and Coles, 2004). BMI requires a great deal of intelligence and creativity from a firm, as well as an understanding of its customers, suppliers and competitors. Managerial competence and knowledge are other key success factors in BMI processes.

The business model canvas (BMC), initially proposed by Osterwalder *et al.* (2005), is a commonly applied tool to map the BM of any particular firm, product or service. It consists of nine main blocks: customer segments; value propositions; channels; customer relationships; revenue streams; key resources; key activities; key partnerships; and cost structure. Using the BMC model, a firm's current BM can easily be depicted, while by creative elaboration (e.g. using notes on a board or a large white screen), alternative models or wanted states of the business can be constructed.

1.2 Competencies as key firm resources

Taking on new forms of value creation requires new knowledge and competencies, which are key resources of a firm. A firm is founded on a special set of knowledge and skills underpinning its practices and BM. A common definition of a competence includes: (1) an ability to perform a task in compliance with the required standards; and (2) dimensions of personal characteristics necessary to demonstrate competent performance (Moore *et al.*, 2002). Competitive advantages arise if there are certain competencies and knowledge in a firm which give it an advantageous market position (Barney, 1986a,b). In other words, firm-specific competencies are potential strategic assets that give a firm an advantage over its rivals. These unique resources should be valuable, rare, inimitable and embedded in the organisation. Lado *et al.* (1992) proposed the competencies of management and strategic focus and resource-based, output-based (e.g. marketing) and transformation-based competencies (i.e. the ability to transform inputs to outputs). More recently, Teece (2018) indicated the need for dynamic capabilities to sense (identify opportunities), seize (to design and refine business models and commit resources), and transform (i.e. realigning structure and culture), all supported by strategic competence. A significant task for e.g. a business advisor is to identify the different needs for capabilities and competencies, in order to help fill gaps, identify areas to improve and develop or find partners of various kinds that may provide with these competencies.

1.3 Developing routines for innovation management

Managing BM changes could be facilitated by adopting e.g. a standard process of innovation management (Tidd and Bessant, 2013). This means building new management routines, as changed practices are needed to realise the new BM. Key resources in this process can be drawn up in the BMC model and key areas for improvements can be located. The process of BM change may follow the steps of 'search-select-implement-capture' (Tidd and Bessant, 2013):

- Search – scanning the business environment (internal and external to the firm). Finding threats and opportunities for change.
- Select – deciding which signals to respond to, selecting what to change, developing a strategy.
- Implement – translating the idea into something new and launching it on the market. What knowledge, capabilities and resources are needed?
- Capture – sustaining continuous adoption and diffusion, learning from progressing, conducting organisational change, building a knowledge base, increasing revenues and profit, etc.

2. Market structure

In recent decades, Swedish agriculture has gone through a process of structural rationalisation. This has resulted in a move towards fewer and larger agricultural enterprises and changes associated with the processes of intensification, concentration and specialisation (Bowler, 1986; Swedish Board of Agriculture, 2017).

The meat industry in particular is a significant example of such development (Belk *et al.*, 2014; MacDonald *et al.*, 2000). The drivers of this transformation include technological innovations (which have resulted in increased productivity), changes in consumption patterns and the emergence of global markets for agricultural commodities (Dimitri *et al.*, 2005). Although these developments may have led to lower food prices for consumers, they have also exacerbated environmental problems (Bowler, 1986), which are now high on the global policy agenda (e.g. FAO, 2017). Lower prices for agricultural commodities have also contributed to relatively lower incomes for farmers and suppliers, and additional economic pressure has emerged as buying, food processing and retail have become increasingly concentrated to fewer actors (Howard, 2008). In addition, there has been increased vertical integration, where the retailer often exercises power upstream in the value chain, putting pressure on primary producers to cut prices and gain economies of scale at farm level (Murphy, 2008; Sexton, 2000).

2.1 Cattle farming in Sweden

According to the Swedish Board of Agriculture and Statistics Sweden (2017), the total number of farms in Sweden decreased from 96,600 in 1990 to 64,600 in 2015. For the specific sector of beef production, the number of farms decreased by around 4% annually in the same period, from nearly 50,000 farms in 1990 to 17,500 in 2015 (Swedish Board of Agriculture, 2017). This structural change has been accompanied by the collapse of the former dominant (near monopoly) co-operative for meat producers, which after Sweden's entry to the European Union in 1995 was deeply affected by the low-price competition and unable to pay competitive prices to its members (Nilsson and Lind, 2015). Between 2002 and 2006, membership of the main meat co-operative in Sweden declined from 33,000 to 22,000, and in 2007 the former co-operative was sold to a foreign stock company (*ibid.*).

Many farmers have thus left meat production, with the smallest and least competitive leaving the business first. However, the change also affected those farms described by Porter (1991) as 'stuck in the middle', i.e. neither having the competitive advantage of economies of scale nor differentiated products motivating higher prices. Hence, as non-competitive firms have dropped out from the market, there has been a higher concentration of firms. With fewer and larger firms, the productivity per farm has also increased. As indicated in the available statistics from the Swedish Board of Agriculture (2017), covering 2002-2014, this development affected small, medium and large farms (Table 1). A large increase in market share was achieved by the smallest 25% of farms in the period, likely due to heavy dropout of even smaller farms rearing cattle, thus increasing the average size and market share of larger farms (Table 1).

Generally, large and medium-sized cattle farms are more profitable than smaller farms (Table 2). The Swedish Board of Agriculture (2017) studied the productivity and structure of Swedish farms and measures profitability using cost-revenue (CR) (the ratio between the cost of production and the production value) and private-cost-benefit (PCB) (including the alternative cost for own work and land rent), as described by Davidova *et al.* (2003) and Iraizoz *et al.* (2007). For the Swedish beef sector, Swedish Board of Agriculture (2017) calculated that 67.8% of farms were profitable in the period 2002-2014 based on CR ratio, while

Table 1. Average farm size (number of cattle per farm) in Sweden, 2002-2014.¹

	Number of cattle per farm				Market share (%)			
	2002	2006	2010	2014	2002	2006	2010	2014
Small (25%)	9	19	19	19	1	15	3	3
Medium (50%)	20	39	33	31	12	29	26	25
Large (25%)	70	117	94	103	86	56	71	72

¹ Values calculated by the Swedish Board of Agriculture (2017: 39). The three farm categories (small, medium, large) are ranked by size as the 25% smallest, the 25% largest, and the remaining 50% medium-sized farms. Market share is based on total production value. Based on a sample of n=2,122 farms.

Table 2. Average profitability and percentage of profitable beef cattle farms (in brackets) in Sweden 2002-2014, based on cost-revenue (CR) ratio and private-cost-benefit (PCB).¹

	CR	PCB
Average	0.93 (67.8)	1.62 (13.9)
Smallest farms (25%)	1.00 (68.8)	1.87 (2.4)
Medium Farms (50%)	0.97 (63.1)	1.77 (4.7)
Largest farms (25%)	0.88 (72.7)	1.33 (31.6)

¹ Swedish Board of Agriculture (2017: 41). The agency's own calculations.

only 13.9% of farms were profitable based on PCB. As most farms in Sweden are private firms, farmer salaries are not included in the accounts (but can be taken as withdrawals from capital), and thus the PCB measurement is probably a fairer indication of (real) profitability. The PCB values indicate that, in reality, most owners do not take out a reasonable salary, but subsidise their business with their own 'free work'. It is also common for owners to postpone their tax-paying to coming years, for the household to rely on the salary of a spouse or partner, or to increase the loans on the property (which generally increases in value) to manage their daily lives.

2.2 The Swedish market for meat – distribution and consumption

Swedish production of beef reached 132,100 tonnes in 2017, of which 20,000 tonnes were exported. Total consumption was estimated to be 246,900 tonnes, giving domestically produced beef a market share of 53.5% in 2017 (Svenskt Kött, 2021). Overall, meat consumption per capita in Sweden has increased over a number of years. Between 1980 and 2020, total consumption of meat increased from 64.0 kg per person and year to 78.6 kg per year in 2020, with a peak in 2016 of 88.4 kg per person and year (Swedish Board of Agriculture & Statistics Sweden, 2021). Hence, meat consumption appears to be in decline in more recent years. Consumption of beef increased from 18.3 kg per person and year 1980 to 22.5 kg per person in 2020, again with a peak around 2015 of 26.2 kg beef per person and year (*ibid.*).

The conventional Swedish distribution chain for cattle goes through one of the main abattoirs and then further to either retailers (directly) or to wholesalers (e.g. for distribution to the restaurant and catering sector). In Swedish official statistics, slaughtered cattle include animals from milk production, whereas calves represent a separate category. In 2020, 420,000 animals (beef and milk cattle) were slaughtered at around 100 certified abattoirs (including smaller farm abattoirs) (Swedish Board of Agriculture, 2021). The largest actor, HKScan Sweden AB, represents around 25% of the market. Smaller abattoirs (e.g. farm abattoirs) are not reported with numbers in the official statistics due to their exposed position in relation to the main actors, but on average each handles around 150 cattle annually. Table 3 lists the five main abattoirs in 2020 and their market share

Table 3. The five largest abattoirs in Sweden and their market share in 2020.¹

Abattoir	Cattle (beef and milk), no. of animals	Calves, no. of animals	Market share
HKScan Sweden AB	103,198	5,351	25%
KLS Ugglarps AB, Kalmar	57,394	26	13%
KLS Ugglarps AB, Hörby	50,476	1,481	12%
Skövde slakteri	40,597	1,806	10%
Dalsjöfors kontrollslakteri	32,514	844	8%
Remaining 94 abattoirs	136,013	3,958	32%
Total	420,192	13,466	100%

¹ Swedish Board of Agriculture (2021), Statistics on approved slaughtered animals in Sweden, 2020.

as regards cattle (including slaughtered milk cattle and calves). In 2020, the average carcass price for heifers in Sweden was €394 per 100 kg, compared with €303 in Denmark and €272 in Germany, whereas the EU average was €323 per 100 kg (EU statistics¹, processed by the Swedish Board of Agriculture²; using weekly exchange rates from the Swedish National Bank). This indicates a price premium on Swedish meat on the Swedish market of around 22%. Heifers normally receive a price premium of around 20-25% compared with cows, and meat from the Limousin breed typically receives an additional premium due to its higher quality.

On the retail side, Swedish food retail has an exceptionally high market concentration to three main retail chains. In 2020, the largest (ICA) had a market share of 52.3% of the total food retail market, followed by Axfood (18.5%) and Coop (18.8%), and then Bergendahls (5.3%) and Lidl (5.1%). Since 2020, Axfood has acquired parts of Bergendahls, further increasing its market concentration. The total value of the Swedish food retail market was around €27 billion in 2020 (DLF and Delfi, 2021). The restaurant and catering sector had an estimated value of around €14 billion in 2019, according to Statistics Sweden (2021). No statistics are available on sales through alternative channels, bypassing the conventional system. The latest estimate of sales in non-retail (e.g. independent convenience stores, ethnic food stores, food markets, independent box schemes etc.), made in 2010, indicated that 4% of food sales were made in such channels (Statistics Sweden, 2011). However, given the increasing interest in e.g. farmers' markets, box schemes and other alternative food networks, this may be a growing market. Internationally, there are also strong indications of the importance of growing alternative food networks (e.g. Hashem *et al.*, 2017; Miralles *et al.*, 2017; Zoll *et al.*, 2017).

3. The farm case

We visited the case farm on a day in late autumn. The drive there, around an hour from the Swedish University of Agricultural Sciences in Alnarp, took us through a pastoral landscape where farmers have worked the land for more than a thousand years. Here and there lie small villages with stone houses, long avenues with old trees leading to a farm or estate, open fields, rolling hills and small copses with emblematic beeches. Above us a red kite, a typical bird of the landscape, followed our trip with great interest. Near the case farm there is a famous restaurant, with a Michelin star, making the area a culinary hotspot. In wintertime the area is sparsely populated, but in summer life blossoms when owners of summer houses (often from Stockholm) and tourists flock to the area to enjoy the rural surroundings, the nearby mile-long beaches and the particular 'northern light' that is said to characterise this part of Sweden. The region is sometimes called 'the Swedish Provence', but this epithet may only be applicable in summer time.

On reaching the farm, we could see the original farm buildings around a typical farmyard. Slightly farther away are the cattle sheds and the site of a new animal house currently under construction. We were greeted by the owner of the farm, Marten, and invited into his kitchen for a chat over coffee and sandwiches. His neighbour, Kjell, who had previously worked with marketing, also joined our conversation. He and Marten got to know each other when Kjell purchased a nearby house for his retirement. He now actively participates in discussions with Marten about his business and gives advice whenever needed. Marten has a Bachelor of Agriculture degree from the Swedish University of Agricultural Sciences and previously worked professionally with horses. He has a great interest in animal breeding and has also worked as an animal inspector and at an agricultural college for a couple of years. Marten took over the farm from his parents a few years ago.

The farm has approximately 60 suckler cows, mainly of the Limousin breed, producing 60 calves a year, which are fattened on the farm. Approximately 10 new cows are recruited annually. Following the typology provided in Table 1, the farm is considered a large-sized farm in the Swedish context, although the perception among customers and visitors is that it is rather small. The farm owns around 85 hectares of land and additional pasture (10 ha) is leased. The land is used as pasture for grazing, but also for producing feed for the winter.

¹ https://ec.europa.eu/agriculture/market-observatory/meat/beef/weekly-carcass-prices_en

² <https://jordbruksverket.se/mat-och-drycker/handel-och-marknad/priser-och-marknadsinformation-for-livsmedel>

Marten is currently the only person working on the farm, but he pays for some extra help when needed. Surplus heifers (around 30 a year) and a few of the younger cows are slaughtered at a neighbouring farm abattoir. The meat is taken back from the abattoir by Marten and packaged into boxes that are sold as ‘natural pasture meat’. The bulls (which are not castrated) are sold through a middleman and not re-purchased by Marten. They are slaughtered at another local abattoir and further sold to local retailers under the label ‘Limousin meat’. The rest of the cows are sold to a larger conventional abattoir at current market prices.

The new animal house that is under construction will allow Marten to increase the stock of cows to 80 animals. This will permit a better and more effective work flow, but also (hopefully) higher revenues. Marten notes that ‘I use all the houses, which were originally built for piglet production. There is no room there for the production size I need. This will be like a one-time rationalisation with a larger volume’. His neighbour adds that ‘these 20 more animals will give you a salary [...] and will give you limited extra work. The alternative is to decrease to 30 animals and take an ordinary job’. The animals today are located in different buildings, requiring complex logistics. Marten also claims that ‘as I use all the spaces I have, it is difficult to maintain good animal welfare. I want it to work with natural breeding, calving, grouping [...] This opens up new opportunities’. Marten also considers natural breeding as a possible added value. The new building qualified for some EU subsidies.

We discussed Marten’s use of his working time and how the change in production logistics may give him more time for his new way to sell his meat. He responded:

That’s right, I work mostly by myself, but Kjell sometimes helps me with the sales so that I can focus. But I also have in mind that it will be simpler for me to employ someone extra when needed. Then I can work specifically only with sales and marketing a day or so per week.

Marten described the three different ways in which he sells his animals (or rather the meat):

1. The heifers are locally slaughtered at the neighbouring farm abattoir. After slaughter, the carcasses are hung for 13-14 days, cut and packaged into meat boxes and returned to Marten, who sells the boxes personally to customers in the region. The meat boxes normally contain 26 kg of beef meat in different fine-cut pieces and minced meat at a price of around €15 per kilo. Marten transports the animals to the abattoir himself, two at a time. The meat is sold under the farm’s own brand. Some of the added values are that it is locally produced, free-range meat and free from antibiotics. The meat has uniformly high quality (in particular as it is meat from heifers). No specific certification scheme is followed, but through his direct contact with the customers Marten can tell them about the production and personally guarantee how the meat has been produced:

Well, I have had some questions, and it is always about whether it is organic meat. I don’t think it matters for the consumer, those we sell to. Very few react [negatively] when you tell them about the production, I feel that the rearing of the animals, and their welfare, is much more important [for the customers] than if it is certified as ‘organic’.

Customers are also always welcome to visit the farm and see the animals with their own eyes. Marten believes that the name of the local abattoir works as a type of ‘guarantee’ and signal of quality. He has gradually been able to increase the price of his products (at first, he set the price at around €9 per kilo), but is not sure if he can increase the price even more for his customers.

2. The bulls are purchased by a middleman that takes the animals to slaughter at another local abattoir. The meat is later sold to retailers as ‘Limousin meat’ by the middleman. Marten actually does not get a much higher price for the young bulls through this channel than he would receive from selling direct to the conventional slaughterhouse, but he dislikes seeing his animals being treated just as ‘commodities’:

The animals just disappear in the same bulk as all the other animals when you send them there [...] they [the conventional abattoirs] may have the formal grading [system], but my animals... they have had another, better life [...] but when they lie there in the trays on the shelves in the supermarket, it does not matter if they had a better life....

He just feels better when he knows that the meat will be sold as high-quality meat and that it can justify his production philosophy, with a high level of animal welfare.

3. The older cows are sold through the conventional slaughterhouse, at current market prices. However, Marten recently slaughtered a cow at the farm abattoir instead, to see if it would be possible to sell meat that way instead. Given that a cow weighs around 150-200 kg more than a heifer, Marten believes that this could be a profitable thing to do.

In the two latter channels, the animals are just sold to the abattoir and Marten has no further involvement in later stages of the distribution chain or in the marketing of the products sold through these channels.

The main part of the business is the personal sales of meat boxes, where Marten takes care of both marketing and distribution himself. The customers purchasing the meat boxes are mainly families in and around the city of Lund in the southern Swedish region of Scania. The families often live in small or semi-detached houses where they have freezer storage capacity for the meat. Lund is a small thriving city of around 100,000 citizens, where the main employers are Lund University, the university hospital, and knowledge-intensive industries in technology, electronics, biomedicine and food technology. Although there are other farmers selling their produce in this way, Marten has experienced no direct competition from them. He delivers the meat boxes himself with his car, a trip of around 60 km from the farm to Lund. In the beginning, he was nervous about having this type of direct contact with the customers, but the experience was more positive than he could ever imagine. He likes the positive response, but also that he can discuss his products directly with the buyer, who gives him feedback on what is better about his products compared with the alternatives. Some of the meat is also sold directly on the farm (a small farm shop). In summer, more sales take place directly in the farm shop and Marten sees good potential. Last summer, he reported:

Suddenly, people began to phone every day and ask what they could have for a barbecue in the evening. Do you have meat for the barbecue? We must have it for the evening... tonight... You have this feeling that you could sell much meat for the barbecue, but it is challenging because then they only want what is suitable for barbecue cooking. Hamburgers as an alternative could be something.

He has also sold at specialist farmers' markets in the past, but no longer does so as it was not rewarding enough. Marten also sells a part of the meat to a specialist butcher/meat shop in central Malmö. In addition, he collaborates with a local restaurant, where the main product is minced meat for hamburgers. This meat is also brought back from the local farm abattoir before being sold to the restaurant.

Marten finds the marketing part the most difficult, as it takes time and it cannot always be prioritised, except in his direct meeting when delivering the meat boxes. He sees himself as a 'producer' rather than a 'salesperson' or a 'marketer'. However, he receives good advice from the neighbour, who previously worked in marketing and advertising. Communication with customers is mainly handled through a website.³ Marten has made great efforts to promote the image of the farm he wants the customers to have. The website has plenty of photographs of cows and nature and a logo that encapsulates these symbols and values. He also participates in a collaboration with other small-scale producers, restaurants and activities along the main car route in the region. Other types of activities include the public release of the cows to pasture in the spring and family events on the farm, such as barbecues, with the aim of attracting visitors to the farm and marketing the products. The neighbour, Kjell, explained:

³ The farm's webpage can be found here: <http://www.tranaslund.se> (only in Swedish).

Well, if you look at the website, we have this picture where you walk with a bucket and twenty cows follow you down to the meadow [...] That is the real brand, the animal care, the local place. The whole website builds on photos from the meadow where the animals walk between stone walls, trees... We also try to symbolise that through the logo.

Marten also communicates through Facebook and Instagram, which are important channels for feedback from customers. However, he is concerned that the communication takes time and he would prefer to spend more time with his family. E-mail works quite poorly, he finds, as it takes so much time and he would prefer better and more simple solutions:

We have this e-mail for everything. When I opened the mail, there were like 1000 unread messages in the inbox, which had not been opened in the last year. That is not sustainable.

Kjell adds that it would be possible to have some form of customer handling system, so that things are more structured.

With his degree in agricultural science, Marten has very good knowledge about the production system. He is aware that some processes are currently too time-consuming and sees the construction of a new cattle shed as a way to improve efficiency and increase the production scale. The production environment is not optimally organised. For example, there are several different buildings, requiring much transportation between them, which makes the work flow more complicated. Marten is also unsure about how long different tasks take. When the new shed is ready, he knows that additional investments will be necessary for making the production more efficient, including new machinery and storage capacity. He feels satisfied and comfortable with his relationship with his bank. He is also a member of the local farmers' association and the Limousin association,⁴ where he can take part in discussions on breeding, participate in animal auctions and find colleagues with similar interests.

There are many work tasks on the farm. Marten does most of the work himself, but sometimes uses help if needed. Planning his time is a challenge and he believes that better competence in leadership and organisation would be a help. He gets help from his neighbour when it comes to discussing marketing and strategic issues and how to communicate with his customers. The local slaughterhouse is an important partner, but not as flexible as he would like:

Well, if I choose to slaughter a heifer and cut it into eights and sell it, then it would be just perfect, because the whole animal is sold. But with these small volumes we have, and when we sell some meat on the farm as well, we are locked-in with the cuttings the abattoir offers. We cannot always receive eights and we cannot just take out just individual parts. Well, it would be fantastic if we could elaborate some and make special cuttings sometimes.

He pointed out that the abattoir has its standard procedures for cutting up meat, and that new types of meat cuts are not so simple to obtain. An alternative he mentioned is to do some of the cutting himself. Nevertheless, by personally selling the meat to consumers he can influence his revenues in a different way than he could through the conventional channels. He does not feel that he gets paid for the added values when only selling the animals to the abattoir and believes that his animals are worth more than being just a commodity.

The firm currently has low profitability, as shown in Table 4. If Marten took out a full salary (including taxes and fees), he would actually operate at a loss. However, sales are increasing year on year, as are profits (before salary). With a larger production quantity, he will probably make an overall profit, and in recent years the economic results have significantly improved. Marten's main goal is to reach reasonable profitability in three years' time, when the expansion is complete. He realises that he needs to work on his organisation and

⁴ The Limousin association web-page: <https://www.limousin-se.info> (only in Swedish).

Table 4. Economic data for the case farm 2013-2016 (amounts in €).

The firm	2013	2014	2015	2016
Turnover	128,181	137,615	159,467	138,536
Result (profit/loss) ¹	-14,145	-9,291	495	2,045
Invested capital (assets book value)	550,774	521,376	604,138	583,006
Solidity (prudent valuation of assets)				58%

¹ The owners 'own salary' is not included in the results. In this type of company, the owner can make a direct withdrawal from the business. The withdrawal must be reported for fees and tax purposes. A withdrawal of e.g. €3,000 would give the owner around €1,600 after fees and taxes (standard tax). The average monthly salary before tax in Sweden is around €3,600 (SCB, 2021).

often feels frustrated when he wants to do more than time permits. When his family goes to the beach in the summer he needs to stay and work on the farm, but he would like to have more time with them. He fears it will take several generations to realise all his ideas and he would appreciate any good ideas to improve his situation and bind the different parts of his business together better.

4. Guiding tasks and questions

Apply the 'Business Model Canvas' as a tool for making an overview of the firm's business model. Fill out a business model canvas of the current situation.

Identify three weaknesses in this current business you think should be addressed (areas for improvement/change).

Update the Canvas with the improved business model. What would be needed to change the business accordingly?

Based on your updated canvas:

- Should Marten scale up or down?
- How should Marten market his beef?
- Should Marten hire help and if so what kind?

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Conflict of interest

None of the authors has any conflicts of interest to report.

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Many sustainability challenges arise from existing production and consumption patterns, and thus many believe that business transformation to sustainability is essential to solving global socio-ecological problems. This thesis explored the potential for transformation to sustainability from the viewpoint of business model transformation in agri-food businesses, to understand why and how transformation happens, and how it can be facilitated at systems level. The results revealed managerial, organisational and inter-organisational processes related to this transformation, which were further conceptualised.

Vera Sadovska received her doctoral education at the Department of People and Society, Swedish University of Agricultural Sciences, Alnarp. She obtained her degree of Master of Science in Business and Economics with a major in Business Administrations at the Swedish University of Agricultural Sciences.

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