Value flows and transaction costs in the potential market for meadow biomass

– the alternative use of meadow biomass

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Abstract

There is an urgency for agricultural firms to increase profitability in order to keep larger areas of meadows under maintenance. The alternative use of meadow biomass is a business opportunity for agricultural firms to increase revenue streams. However, there is a knowledge gap regarding the potential value flows created by firms, as well as the obstacles impeding firms' development in the market for meadow biomass.

The purpose of this thesis is to create an understanding of how values might be created by agricultural firms through the market for alternative use of meadow biomass. The purpose also includes to create an understanding of the possible obstacles impeding firms' ability to develop in the market. To achieve the purpose of this thesis the Sustainable Business Model archetype "Create value from waste" and transaction cost theory will act as the theoretical lenses. Based on the aim and research questions, the study was performed with qualitative research methods. With a multiple case study design and semi-structured interviews, four agricultural firms participated in the study. The empirical findings were categorised through open coding and analysed through a within- and cross-case analysis.

The results showed how incorporation of economic, environmental, and social aspects in the Sustainable Business model archetype can create value flows in the potential market for meadow biomass. Moreover, the result also displays possible transaction costs impeding firms' development in the market.

Keywords: Mown meadows, meadow biomass, agricultural firms, value proposition, value creation, value capture, sustainable business model, market, transaction costs

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1. Introduction

In this chapter the background is presented and constitutes the foundational basis for the problem statement. The problem statement argues for a current lack of knowledge in research and thus, the purpose of the thesis is to study the stated knowledge gap. Furthermore, the aim and research questions are formulated with the background and problem statement in mind and are intended to be helpful with fulfilling the purpose. Finally, the delimitations and outline are provided to facilitate a straightforward overview of the content and process of the preformed study.

1.1. Background

1.1.1. The function of meadows then and now

The pre-industrial agricultural system in Sweden was built upon the ability of livestock to transform vegetation, inedible for humans, into manure. The livestock manure, in turn, was used to fertilize arable land for cultivating crops (Lennartsson & Westin 2019). Meadows had a significant function in the pre-industrial agricultural system i.e., to produce hay as a source of nourishment for livestock to survive the cold winters. In other words, meadows were the main component in the ladder of nutrition (Westin et al. 2013). However, as yields of hay from meadows determined the amount of manure available to fertilize arable land, meadows acted as a bottleneck in the system. Meadows as a limited resource can be reflected in the old saying:

> Äng är åkers moder.

Meaning that the size and quality of the meadow determine yields of crops on arable land (Lennartsson & Westin 2019). During the agrarian revolution, from about 1700 until 1870, the agricultural system was minted by expansion of arable land in line with population growth, which resulted in an extensive transformation of the agrarian landscape (Lennartsson & Westin 2019; Morell 2001). Areas of new cultivated arable land increased at the expense of areas of meadows, which brought

difficulties with collecting enough winter fodder for livestock (Päiviö 2008). Consequently, the agricultural system faced new challenges. The shortage of meadow hay contributed to a scarcity of manure to fertilize extended areas of arable land. To compensate for the shortage of meadow hay it became more common to cultivate fodder on arable land (Lennartsson & Westin 2019).

From about 1870, industrialization started to influence agriculture. Areas of meadows continued to drop in size and between the years of 1870 and 1945 areas of meadows decreased from 2,5 million hectares to 250 000 hectares, which equals to a 90 percent reduction (Lennartsson & Westin 2019). Eventually, as artificial fertilizers started to be commonly used throughout Sweden, meadows became completely disconnected from its former purpose (Lennartsson & Axelsson Linkowski 2011). Today, meadow hay is not used to feed livestock. Livestock fodder is rather cultivated on arable land through ley farming with external input factors i.e., fossil energy sources. Hence, the initial function of meadows in the agricultural system has been lost (Westin et al. 2013).

Today, it is possible to attain economic support i.e., Agri-environmental payments, for the maintenance of mown meadows. These payments can be received by those who take care of their land in a way which is good for the environment (Jordbruksverket 2021). It is argued that the Agri-environmental payments have increased incentives amongst landowners to maintain mown meadows and thus, contributed to an increase of meadows, from 2000 hectares in 1990 to approximately 9000 hectares in 2012 (Svensson & Moreau 2012). However, the meadows that remain today are mowed as an attempt to maintain natural- and cultural values in the agricultural landscape (Lennartsson & Westin 2019). The maintenance and restoration of meadows in Sweden are of high priority and thus, emphasised in the Swedish environmental target system (Naturvårdsverket 2019) and EUs Habitats directive (Naturvårdsverket 2020). The possibility to apply for Agri-environmental payments for mown meadows shows that the purpose of meadows has changed from being the main source of nutrition in the agricultural system, to merely bringing positive environmental externalities paid for by society (Lennartsson & Westin 2019).

According to an evaluation of EUs Habitats directive 2013-2018, biodiversity linked to the agricultural landscape in Sweden is threatened. (Naturvårdsverket 2020a) Rationalisation of agriculture has made meadows' former purpose redundant in current agricultural system and due to low profitability large areas of former meadows have been abandoned. The few meadows that remain usually consists of small and isolated areas, which is rather unfavourable for biodiversity. The Agri-environmental payments available in line with EUs Common Agricultural

Policy, CAP, helps to promote maintenance of meadows. However, it is acknowledged that the levels of Agri-environmental payments are not enough to ensure long term maintenance of meadows (Wallander et al. 2019). Therefore, to reinforce the long term maintenance, increased profitability for meadow management is required (Naturvårdsverket 2020a).

1.1.2. Alternative use of meadow biomass

To receive Agri-environmental payments for mown meadows, several maintenance requirements must be fulfilled. One of these requirements implicate that all mowed vegetation, the meadow biomass, must be removed from the meadow to prevent harmful accumulation of litter, simply to retain nutrient-poor soils (Jordbruksverket 2021). However, no requirements emphasise any areas of alternative use of the harvested meadow biomass, for example the alternative use as livestock fodder. The Swedish Board of Agriculture, SBA, executed an economic evaluation concerning the areas of alternative use regarding meadow biomass (Hall Diemer et al. 2013). One of the conclusions in the report implies that the alternative use of meadow biomass as fodder is irrelevant due to the lack of demand. The authors of the report stated:

> We do not see a chance of any significant demand for other uses at present, even if there might be markets for it on a local basis (Hall Diemer et al. 2013:53).

Even though there are potential alternative areas of use of meadow biomass there is still scepticism about whether demand will be adequate for it to be successful (Carlsson et al. 2014).

Alternative use of meadow biomass could possibly bring socio- economic gains. For example, if livestock fodder cultivated on arable land was partly replaced with meadow hay, some arable land would be released for cultivation of food instead of livestock fodder (Gyldberg & Stenmark 2015). Additionally, it is argued that animals fed with abundant amounts and various kinds of herbs attain a healthy fatty acid composition, which has positive effects on the quality of the meat (Världsnaturfonden 2014). Another socio-economic benefit would be the increase of self-sufficiency of utilities i.e., food and energy (Gyldberg & Stenmark 2015). Self-sufficiency is important since it makes local communities less vulnerable to eventual disturbances of external supply of utilities (Carlsson et al. 2014). For example, during the drought-year in 2018 there was a disturbance of external supply of utilities expressed in poor hay harvests and weak regrowth of pastures in Sweden. Consequently, the lack of livestock fodder contributed to increased demand for meadow hay (Länstyrelsen Värmland 2018).

One argument against using meadow biomass as livestock fodder is the fact that meadows are favourably mown in late summer, which affects meadow hay to contain lower levels of crude protein and higher levels of cellulose. (Svensson & Moreau 2012) The poor levels of crude protein are argued to be unfavourable for producing-livestock e.g., dairy cows, since these animals require high levels of crude protein to stay productive. Hay from ley farming is therefore argued to be more suitable for producing-livestock, since ley usually is mowed in early summer and hence, contain higher levels of crude protein.

On the contrary, meadow hay could be suitable as fodder for suckler cows, heifers, and dry cows since these animals do not require as high levels of crude protein. Additionally, because of the low levels of crude protein in meadow hay, it could be especially suitable as fodder for horses and sheep (Svensson & Moreau 2012). It can help horses avoid laminitis, a disease usually caused by too nutritious pasture or fodder (Distriktsveterinärerna 2021). It is also important to acknowledge that the high levels of cellulose would contribute to increased chewing which is a decisive factor for horses' welfare (Sassner & Granswed 2019). Simultaneously, meadow hay harvested from permanent grasslands i.e., unploughed land, contains less amounts of dust which are argued to be beneficial for any animal (Svensson & Moreau 2012).

1.1.3. The potential market for meadow biomass

At present, meadow biomass is frequently handled as a by-product of nature conservation for preservation of biodiversity (Sveriges Radio 2021) and as meadow biomass currently have no commercial alternative area of use, it is often deposited as waste (Gyldberg & Stenmark 2015). According to Carlsson et al. (2014:18) it is about as common to use the meadow biomass as fodder, as it is not using it at all. However, the potential for meadow biomass to be used as fodder for animals (Svensson et al. 1995; Carlsson et al. 2014), constitute opportunities for agricultural firms to increase individual profitability by maintaining larger areas of meadows (Länstyrelsen Värmland 2021). Although, for meadow hay to be used and sold as fodder there must be a market for it (Hall Diemer et al. 2013). To develop markets, it is important to attain an efficient value flow and entrepreneurs are believed to gain value through design and implementation of novel business models (Porter & Kramer 2011:10).

Sustainability issues are becoming increasingly pressing on nature and humans. Consequently, many and various firms are starting to incorporate sustainability aspects into their business models. The concept of a Sustainable Business Model, SBM, is perceived to have great potential of incorporating sustainability aspects in a firm's proposition, creation and capturing of value (Boons & Lüdeke-Freund

2013). The purpose of the SBM is simply to incorporate environmental and social aspects, in concert with economic facets, into a business model (Bocken et al. 2014). The traditional business model is perceived to communicate value propositions, value creation and value capture (Richardson 2008; Osterwalder et al. 2005), see Figure 2, while the SBM further develops this idea by interweaving sustainability aspects into the model.

The emerging market of Swedish wool can act as an illustrative example of entrepreneurs gaining value through the design and implementation of a novel business model. Initially, wool from Swedish sheep farms was treated as a by-product of mutton- or sheepskin production and, consequently, huge amounts of high-quality wool were deposited as waste every year (Bäckström 2019). It was only recently, when the digital platform Ullförmedlingen[1] was founded which helped to increase the interest for Swedish wool (Odmark 2019). The initial purpose of the digital platform was to create a venue for sellers and buyers (Ullförmedlingen 2018). When key stakeholders were connected, value was created and a market for Swedish wool emerged. Similarly, the potential market for meadow biomass might expand through firms' application of the SBM.

1.1.4. Some examples: Meadow biomass as a resource

The question of using meadow biomass as a resource has recently been raised in some parts of Sweden. For example, the county of Värmland, see Figure 1, performs content analyses on meadow biomass to present concrete numbers of nutrition- and mineral values. The initiative is performed with the purpose of increasing agricultural firms interests to make use of the meadow biomass (Drakenberg & Tikka 2020). The county suggests that meadow biomass could be especially interesting as fodder for horses (Länstyrelsen Värmland 2021). Moreover, during the drought-year in 2018, the relevance of using meadow biomass as fodder was highlighted by the county. Due to the shortage of livestock fodder the county offered meadow hay, harvested from natural reserves, as supplementary fodder for local livestock (Länstyrelsen Värmland 2018).

Another example regards to the municipality of Sala, in the county of Västmanland, where a meadow called Nötmyran is generating thousands of tons of meadow biomass every year. The meadow hay is currently used as supplementary fodder for young cattle, horses, and sheep. It is mainly used locally at the farm or sold outside the area (Ström 2006). Moreover, the county of Gävleborg has earlier initiated a project aiming to explore the possibilities of creating a market for meadow biomass, to attain the economic prerequisites for increasing the maintenance of meadows

[1] Ullförmedlingen is a digital platform for selling and purchasing wool. The purpose of the platform is to facilitate and develop the market for wool (Ullförmedlingen 2021).

(Naturvårdsverket 2015). Although, no results from this initiative have yet been published. The examples above illustrate the motivation to increase the alternative use of meadow biomass. However, it would be interesting to raise questions concerning the firms at the market of meadow biomass i.e., how value flows might be created by firms and what is impeding firms from developing at the market.

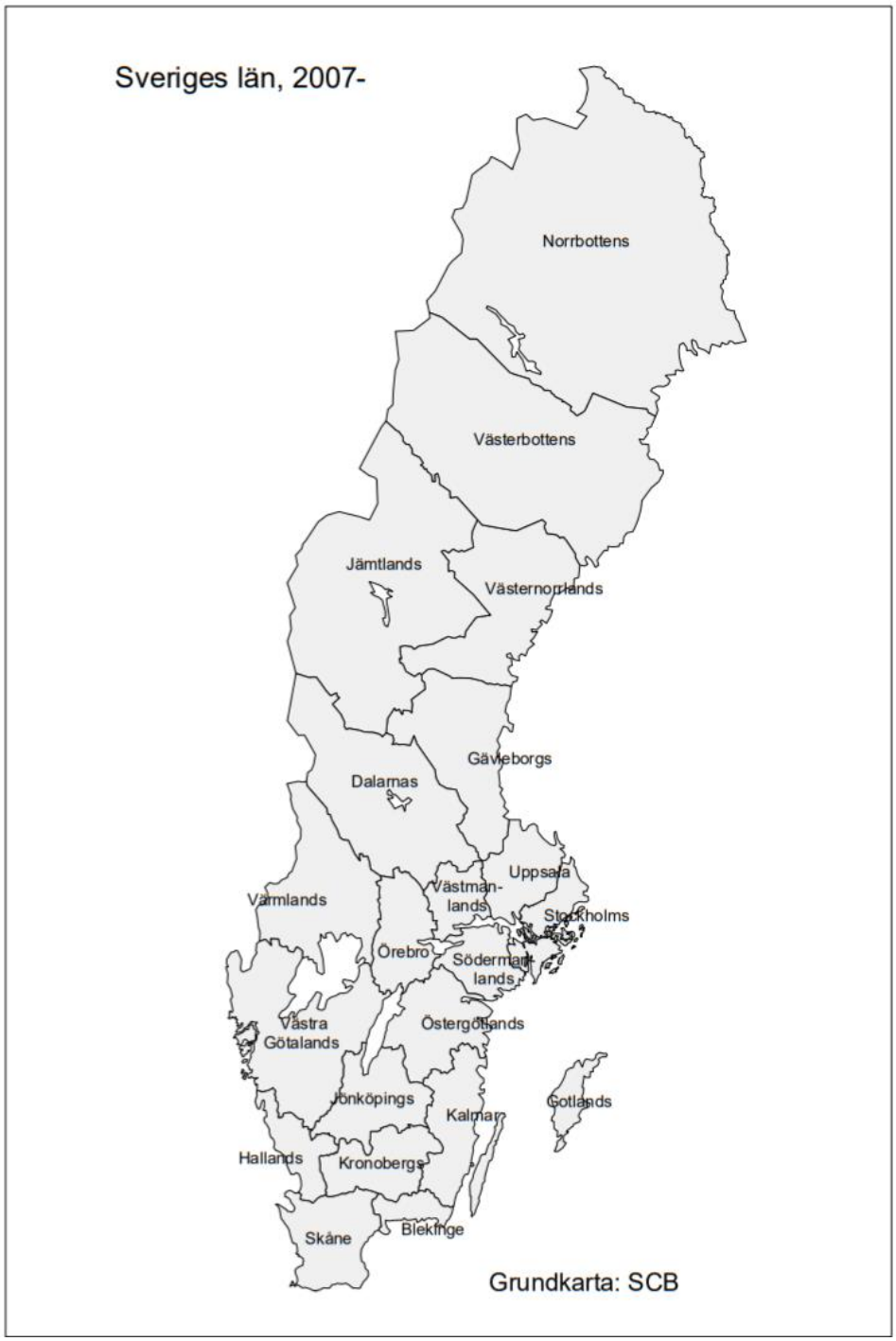

Figure 1. Map over the Swedish counties, 2007-, (Statistics Sweden 2021).

1.2. Problem statement

Recently, the alternative use of meadow biomass has received attention throughout Sweden (Länstyrelsen Värmland 2021; Ström 2006; Naturvårdsverket 2015). However, there is still a knowledge gap concerning the potential value flows created by firms in the market for meadow biomass, as well as the obstacles impeding firms' development in the market. Therefore, the purpose of this thesis is to create an understanding of how values might be created by agricultural firms through the market for alternative use of meadow biomass. Additionally, the purpose includes to create an understanding of possible obstacles impeding firms' ability to develop in the market for meadow biomass.

There is an urgency for agricultural firms to increase profitability in order to keep larger areas of meadows under maintenance (Naturvårdsverket 2020a) and the alternative use of meadow biomass is a business opportunity for agricultural firms to increase revenue streams. However, meadow biomass is often perceived as waste since it is frequently deposited at the edge of fields (Gyldberg & Stenmark 2015). Thus, to achieve the purpose of this thesis the SBM archetype "Create value from waste" (Bocken et al. 2014:49) will act as a theoretical lens to explore the economic, social, and environmental values that might emerge in line with the alternative use of meadow biomass. Further explanations of the SBM archetype will be outlined in Chapter 2.

The obstacles impeding firms from using the market efficiently can be connected to transaction costs (Coase 1937). Transaction costs accounts for the activities required to make an exchange i.e., search for information about products, prices or sellers and buyers; writing contracts; and checking that the contract has been fulfilled in line with the agreement (Hobbs 1996). Thus, to achieve the purpose of this thesis, the possible obstacles for firms to develop in the market for meadow biomass will be explored through the transaction cost theory. The important characteristics and attributes of transaction costs will be further explained in Chapter 2.

1.3. Aim and research questions

The aim of this study is to create an understanding of how firms might create value flow in the potential market for meadow biomass, through the lens of the SBM archetype. Furthermore, the aim includes to explore possible transaction costs impeding firms' development in the market for meadow biomass. Based on the aim, the research questions are outlined below.

I. How might firms create value in the potential market for meadow biomass through a sustainable business model archetype?
II. What are the possible transaction costs impeding firms' development in the market for meadow biomass?

1.4. Scope and delimitations of the study

The scope of the study is focused on four agricultural firms based in the counties of Kalmar and Stockholm. The geographical positions of each county can be viewed in Figure 1. The agricultural firms chosen for this study are in some way active at the market for meadow biomass hence, the geographical scope is determined by the locations of these agricultural firms contributing to value flows through the alternative use of meadow biomass. The study will not consider any other actors at the market for meadow biomass i.e., buyers or mediators, since the applied theoretical framework concerns business models and transaction costs connected to individual firms.

Even though the quality of the performance of meadow management is an interesting aspect, it is not included in the scope of the study. The scope is rather focused on the economic, environmental, and social values created through alternative use of meadow biomass. Moreover, the scope put no emphasis on the requirements for the specific time for mowing concerning meadows that are considered to have special natural values. The scope rather focusses on the fact that meadows, generally, are mown in late summer i.e., from the first of July and onwards.

Because of the lack of other studies performed within this field of research, there is a lack of guidance in the literature to perform a study like this one. Therefore, finding theories in the literature that is suitable for investigating the field of research was challenging. It is important to acknowledge the drawbacks of the chosen theories for this study. For example, the Sustainable Business Model archetype might be more suitable to investigate larger organisations or industries, rather than individual agricultural firms. However, through the theoretical framework of the study, see Figure 5, some interesting insights can be drawn when applying the SBM to individual agricultural firms.

1.5. Thesis outline

The outline of the thesis follows the chapters of introduction, literature review and theoretical framework, methodology, empirical background and findings, analysis,

discussion, and conclusions. In Chapter 1. Introduction, the chosen field of research is presented through background, problem statement, aim, research questions, as well as scope and delimitations. In Chapter 2. Literature review and theoretical framework, relevant theories are described and used to investigate the stated subject of investigation. In Chapter 3. Methodology, questions regarding what is done and why, are answered. Explanations are provided of how data is collected, what boundaries are applied and how the collected data will be analysed. In Chapter 4. Empirical background and findings, the collected data is presented. In Chapter 5. Analysis, the empirical findings is interpreted, described, and explained based on the theoretical framework. In Chapter 6. Discussion, the analysis of the empirical findings is summarized, discussed and critical reflected on based on the research questions. In Chapter 7. Conclusions, the main conclusions are presented based on the aim of the study.

2. Literature review and theoretical framework

In this chapter the existing literature from the two theoretical fields, the SBM archetype and transaction cost theory will be presented. Through the synthesis of the theoretical framework, connections between the essential theoretical domains are illustrated and used as a conceptual framework throughout the study.

2.1. Traditional business model

The value flow created and delivered by firms can be represented in a business model, constituted by the elements of value i.e., proposition, creation, delivery and capturing of value. For any firm to be successful, it is essential to be able to efficiently comprehend the functions and connections of the value elements (Chesbrough 2010). Thus, the purpose of the business model is to communicate the value elements to make sense of the business ideas (Osterwalder 2004). According to Osterwalder (2004) and Osterwalder et al. (2005) the business model can be defined as:

> […] a conceptual tool that contains a set of elements and their relationships and allows expressing a company´s logic of earning money (Osterwalder 2004:15).
>
> Therefore, we must consider which concepts and relationships allow a simplified description and representation of what value is provided to customers, how this is done and with which financial consequences (Osterwalder et al. 2005:3).

The value elements of a business model are expressed in value proposition, value creation and value capture. According to Richardson (2008:138) the *value proposition* considers what kind of value is delivered to customers; customers willingness to pay for it; and the competitive advantage of the firm. The *value creation* regards to the creation and delivery of value to customers, while the *value capture* considers how revenue streams and profits are attained. The value elements of a traditional business model have been processed and construed by Bocken et al. (2014:43) and demonstrated in Figure 2.

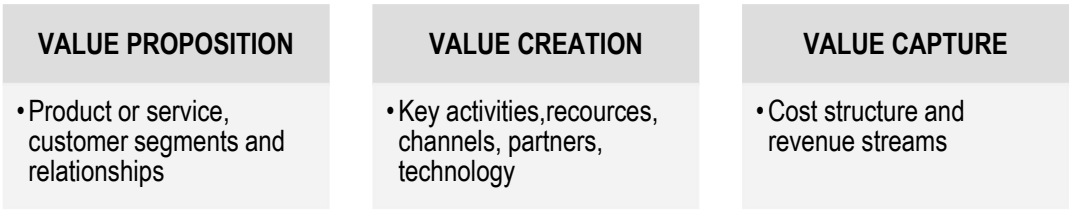

Figure 2. Traditional business model (Bocken et al. 2014:43).

2.2. Sustainable business model archetype

The SBM archetype "Create value from waste" is defined by Bocken et al. (2014:49):

> The concept of waste is eliminated by turning waste streams into useful and valuable input to other production and making better use of under-utilized capacity (Bocken et al. 2014:49).

In line with the definition, the SBM arcetype aims to improve resource efficiency by creating value out of what is currently precived to be waste. The features of the elements are demontrated in Figure 3.

Figure 3. Sustainable business model archetype (Bocken et al. 2014:49).

Similarly to the traditional business model the SBM archetype is constituted by the same elements e.i., value proposition, value creation and value capture (Bocken et al. 2014). However, unlike the traditional business model, the SBM archetype is emphasising aspects of sustainbility. Thus, the element *value proposition* is argued to provide balance between environmental and social values in concent with economic values (Boons & Lüdeke-Freund 2013). The sustinable business model archetype specifically target the eliminiation of waste by transforming it into a valuble resource for other products (Bocken et al. 2014:49).

The element *value creation* considers the seizing of value through new business opportunities, new markets or new revenue streams (Beltramello et al. 2013). The element is interpreted as the main attribute of a business model since it provides data and evidence required to create value for customers (Teece 2010). Moreover, co-creation i.e., colloboration, between stakeholders is neccessary for the value capture to be successful (Prahalad & Ramaswamy 2004). According to the SBM archetype the main function of the element is to initiate new partnerships between stakeholders to seize and transform waste into valuable resources (Bocken et al. 2014:49).

The initial purpose of the element *value capture* is to target sources of revenue streams i.e., capture value through product provisions (Bocken et al. 2014; Teece 2010). Furthermore, it is important to attain profit margins greater than associated costs (Richardson 2008). However, the SBM archetype aims to reduce, not only economic costs through reduced waste, but also emphasise the reduction of environmental costs. The transformation of waste into value should contribute to positive consequenses for society (Bocken et al. 2014:49).

2.3. Transaction cost theory

The initial idea of transaction costs was established to explain the emergence of firms. In the article "The Nature of the Firm" Coase (1937) stated:

> The main reason why it is profitable to establish a firm would seem to be that there is a cost of using the price mechanism (Coase 1937:390).

The statement imply that transaction costs can be reduced if market transactions are accomplished within a firm. However, transaction costs never can be eliminated and thus, firms are impeded from using the market efficiently (Coase 1937). Transaction costs can be defined as the cost of accomplishing a market transaction between two or more parties and occurs both ex ante, before the transaction, and ex post, after the transaction (Hobbs 1996:17). Transaction costs are characterised by costs associated to the search and processing of information, the negotiation and renegotiation of contracts, the monitoring and enforcement of agreements and can thus be divided into *information cost*, *negotiation cost* and *monitoring cost* (Coase 1937).

Information costs includes the costs of searching for information about products, pricing and finding buyers or sellers, while the negotiation cost arises when making the physical agreement by writing contracts or negotiating about contracts. The

monitoring cost considers the costs of making sure the agreement is fulfilled by all parties ex post the transaction. (Hobbs 1996) However, in some situations it might be lack of information ex ante the transaction and in such cases the transaction is considered as information cost. Individuals can never possess complete information about products or prices. The incomplete information affect capacities to make rational decisions and thus, contributes to uncertainties expressed in transaction costs (Williamson 2008). The categories of transaction costs can be viewed in Figure 4.

Figure 4. Transaction costs. Based on (Hobbs 1996).

2.3.1. The attributes of transaction costs

To explain why transaction costs occur, some important attributes are necessary to take into consideration. The attributes of transaction costs consist of two assumptions about market actors i.e., *bounded rationality* and *opportunism*, and three main transactional dimensions i.e., *asset specificity*, *frequency*, and *uncertainty* (Williamson 1979). Naturally, humans have a limited ability to act rationally and thus, there is a risk that humans might act opportunistically in favour of own interests. However, it is important to lift the fact that opportunistic behaviour often is triggered by transactions permeated by high degrees of asset specificity, occurs frequently and/or are embossed by future uncertainty (Rindfleisch & Heide 1997).

The assumption of bounded rationality imply that humans have limited capacity to make rational decisions. Thus, even though humans intend to act rationally the bottleneck is embedded in limitations to process and communicate information (Simon 1957). The assumption of opportunism considers the tendencies to seek for individual benefits by acting unfaithful towards trading counterparts (Riordan & Williamson 1985). The most relevant attributes of transaction costs for this study are uncertainty and frequency. Uncertainty considers the uncertainty in the situation itself malfunctioning communication between the trading parties which often result in imperfect contracts. (Riordan & Williamson 1985) Frequency considers how frequently a transaction is performed. With a low frequency of transactions, it might be difficult for firms to avoid high transaction costs.

2.4. Synthesis of theoretical framework

The synthesis of the theoretical framework will act as the foundational basis for the analysis of the empirical findings. The traditional business model in combination with the SBM archetype, outline the elements of value flow i.e., value proposition, value creation and value capture. These intertwined models acknowledge not only economic values, but also values of sustainability i.e., environmental, social. Thus, the model provides a broader insight of the components of value flow to customers and society at large (Bocken et al. 2014).

Furthermore, since transaction costs might impede firms from using the market efficiently (Coase 1937), it is relevant to include transaction costs in the synthesis of theoretical framework. The transaction costs, constituted by information cost, negotiation cost and monitoring cost (Hobbs 1996), can potentially be found in all stages of the business model. Additionally, the attributes of transaction costs are included in the synthesis of the theoretical framework, even though they are not visible in the illustration. Figure 5 presents the connection between the SBM archetype and the characteristics- and attributes of transaction costs.

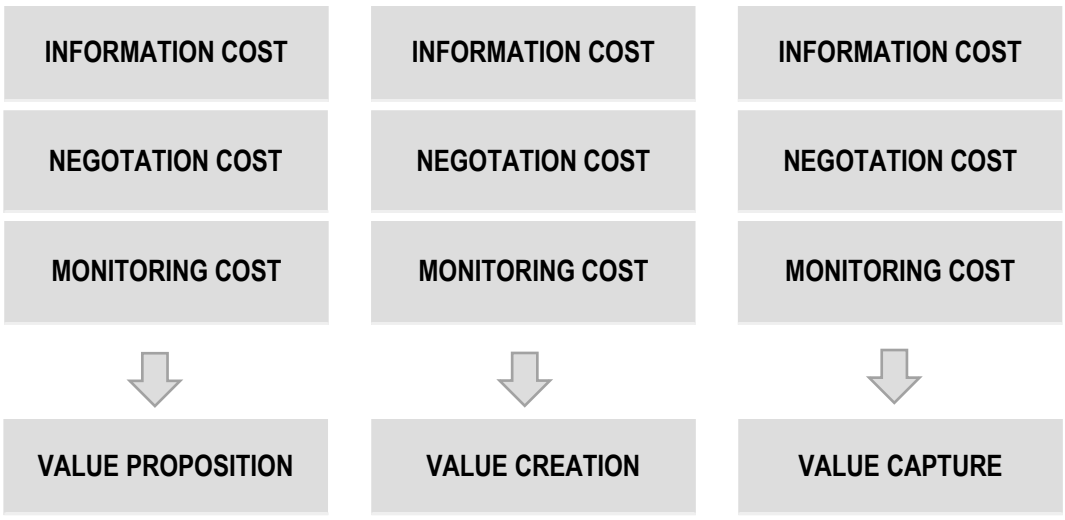

Figure 5. Synthesis of theoretical framework. (Own processing).

3. Methodology

In this chapter the methodology of the study will be outlined and discussed. The chapter begins with a description of the research philosophy and design of the study. Moreover, the chosen research philosophy and design influence what methods are used to fulfil the aim of the study. The methods and strategies for collecting and analysing data will be presented, followed by a description of the quality criteria and ethical considerations of the study.

3.1. Research philosophy

When research is conducted it is important to ensure that there is consistency between the components of research philosophy i.e., *ontological*, *epistemological* and *methodological assumptions* (Bell et al. 2019). With a consistency between these assumptions the research findings are more likely to be applicable in practice. The ontological assumption considers the essence of real-life (Bell et al. 2019:26) and thus, addresses how a social phenomenon can be interpreted and understood (Guba & Lincoln 1994). Based on the ontological assumption the epistemological position considers the understanding of how knowledge can be attained and what can be known and not known about the perceived reality (Bell et al. 2019).

The ontological assumption permeating this study is the constructionist ontology hence, it will contribute to further understanding of how value flows might be created in the market for meadow biomass, as well as possible obstacles impeding firms' development at the market. For this study the understanding of the reality is perceived to be socially constructed and the epistemological position is therefore interpretivist. The constructionist and interpretivist considerations constitute a paradigm with the intention to create an understanding of the social world (Mackenzie & Knipe 2006), based on the conceptions and experiences of the actors in it (Bell et al. 2019). The research paradigm plays a crucial role in determining the methodological assumptions (Mackenzie & Knipe 2006), which can be somewhat reflected in the research strategy of a study. Based on the ontological and epistemological reasoning, the qualitative research strategy can provide valuable insights when human behaviour is to be understood.

3.2. Research design

Because the field of study lack earlier studies and thus, are yet unexplored it is appropriate to use an inductive approach (Given 2008), to generate theory from the empirical findings. Furthermore, to understand the complexity of created values and transaction costs in the market for meadow biomass, a case study design is appropriate (Yin 2009). The case study includes to make in-depth descriptions of individual cases representing the social phenomena within its contextual condition (Creswell et al. 2007). The case study design is also advantageous to use when there are no clear definitions of the boundaries between relevant phenomenon and the real-life context (Yin 2009). For this study a multiple-case study design is applied to identify firms' patterns at the market for meadow biomass and four cases are selected to illustrate these patterns.

Multiple cases can be beneficial since various perspectives are provided on the same issue, as suggested by Creswell et al. (2007). Multiple case studies enable the researcher to establish a single set of conclusions that are based on several cases' similarities and differences (Yin 2009). Furthermore, Eisenhardt (1989) acknowledged the strengths with generation of theory from case studies, due to its close connections with the empirical findings. In a case study, clear boundaries and unit of analysis should be defined (Yin 2009). For this study, the case boundary is the firms, while the unit of analysis is how firms might create value in the potential market for meadow biomass in line with the SBM archetype and firms impeded development in the market by possible transaction costs. By using a multiple case study design, the researcher aims to compare several cases against each other, a method that sometimes can be both time consuming and expensive. However, since it is possible to make single sets of cross-case comparisons and conclusions the findings are viewed to be robust and reliable (Hafiz 2008).

3.3. Literature review

The literature review assists the researcher to interpret and process knowledge that already exists within the field of research (Given 2008) and thus, to build arguments for the research that is to be conducted. In this study a narrative literature review is used to attain better understanding of the subjects applied to this study i.e., agricultural firms value flows and transaction costs related to the alternative use of meadow biomass. The narrative literature review helps to gain an initial impression of the phenomenon which is to be better understood through research. (Bell et al. 2019) The narrative review is permeated by a certain flexibility concerning setting boundaries for the research and are therefore often used in consistency with interpretivist epistemological positions and qualitative research strategies. The

literature review constitutes the foundation for the problem statement, aim and research questions of this study. The literature used for the study is mainly based on peer reviewed articles derived from the databases Google scholar and Web of Science. Highly cited and up-to-date articles have been used to the extent of availability. The following keywords were used to find relevant articles: Mown meadows, meadow biomass, agricultural firms, value proposition, value creation, value capture, sustainable business model, market, transaction costs.

3.4. Data collection

The main method for data collection for the study consists of semi-structural interviews. Entrepreneurs of agricultural firms, active in the market for meadow biomasses, acts as the informants and thus, constitute the main source for data collection. According to Eisenhardt (1989) it might be beneficial to use a mix of methods for collection of data to bring a comprehensive understanding of the cases. For example, by collecting data from documents, firm accounts or websites are suitable to attain a holistic understanding of the social phenomenon. However, since secondary data about the agricultural firms are rather unavailable and because there is a lack of other studies performed within theis field of research, interviews as a qualitative research method can provide relevant knowledge development (Alvesson 2003).

3.4.1. Sampling strategy

In a qualitative multiple case study, it is essential to reflect upon the question of replicability, hence, to avoid inaccuracy or bias (Yin 2009). Because agricultural firms' creation of value flows in the market for meadow biomass as well as firms' impeded development in the market caused by possible transaction costs, can be a rather complex phenomenon, a smaller number of cases is chosen for this study, as suggested by Yin (2009). Four cases are selected with the requirement of being active at the market for the alternative use of meadow biomass. The sampling strategy can be viewed as purposive, hence the firms are selected to allow the research questions to answered (Bell et al. 2019), thus, based on their availability and being active at the market for meadow biomass. The aspect of closeness could be solved due to the availability of digital communication tools such as Zoom. The sequential approach has been used, meaning that the process of sampling first involves an initial sample, and more samples are gradually added to help answer the research question (Teddlie & Yu 2007). Furthermore, it might be reasonable to suggest that snowball sampling also is used for this study since initial contacts are used to establish contacts with other potential informants, as suggested by Bell et al. (2019).

3.4.2. Semi- structured interviews

The qualitative interview can be divided into two sub-groups i.e., unstructured interview and semi-structured interview. (Bell et al. 2019) Since unstructured interviews usually are informal and thus, similar to regular conversation, it might be difficult to make approximate forecasts of how the empirical findings will be displayed. On the other hand, in a semi-structured interview the researcher often prepares a list of questions as a guidance to cover the field of study, which facilitates a simpler path towards answering anticipated research questions. The interview guide, see Appendix 2, is constituted in line with a semi-structured interview through open-ended questions. The questions from the interview guide are based on the theoretical synthesis which are developed from the literature review and problem statement. The questions include value flows connected to alternative use of meadow biomass in line with the SBM archetype. The questions also include transaction costs that impede the firms from using the market efficiently. Hence, the empirical findings, in Chapter 4, are organised in subheadings accordingly to the theoretical framework. Additionally, some questions relate to background to describe the contextual conditions of the firms.

Table 1. Conducted interviews

	CAROLINE	EMMA	PER	KAREN
DATE	30/11-2021	30/11-2021	10/12-2021	1/12-2021
INTERVIEW LENGTH	80 minutes	60 minutes	60 minutes	70 minutes
METHOD	Zoom	Zoom	Phone	Zoom

Table 1 presents the date each interview was conducted, interview length and method of interview i.e., through Zoom or Phone. The interviews were accomplished by the digital communication platform Zoom since the informants' locations were rather spread out in the country, both in the county of Stockholm and Kalmar. The use of Zoom made it possible to not only hear the informants but also perceive body language and contextual settings, which can be beneficial to attain a comprehensive picture of the informants, as suggested by Alvesson (2003). An additional advantage with accomplishing the interviews through Zoom was the opportunity to record video, of course with permission from the informants', which made it possible to observe voice and body language when making the final transcription.

One of the interviews were accomplished by phone, due to some technical issues with Zoom. Even though it were not possible to perceive body language for this interview, which can be a disadvantage according to Alvesson (2003), the interview was recorded and transcribed with permission from the informant. The interviews were held in Swedish since the informants were more comfortable speaking their

native language. The transcriptions were accomplished to capture and interpret the answers as accurate as possible and then translated into English. However, it is important to acknowledge the risk of misinterpretations when the researcher translated the transcripts from Swedish to English. According to Temple & Edwards (2002) the translation of information from one language to another can be challenging since there is a risk that the subjective views of the researcher might permeate the translation of transcripts.

3.5. Data analysis

The inductive analysis with open coding is used to break down the interview transcripts into smaller components (Bell et al. 2019) and thus, assist the researcher to attain new insight about the investigated phenomenon through creation of categories (Zhang & Wildemuth 2009). In this study the creation of categories is based on Bocken et al. (2014) and Hobbs (1996) and will be used to identify how key values are created and what possible transaction costs emerge through the alternative use of meadow biomass. The systematic categorization through labelling of qualitative data facilitates the possibility to find similarities and differences throughout the collected data (Corbin & Strauss 1990). When codes are created before data collection, the coding can be argued to be deductive. However, theories from literature can also be used as a foundation for categorisation that enable themes to emerge from the data, which can be viewed as an inductive process (Zhang & Wildemuth 2009).

The created categories through open coding will be used to perform both a within case analysis and a cross-case analysis, as suggested by Eisenhardt (1989). The within case analysis help the researcher to become familiar with the data through individual write-ups of the cases. Furthermore, the cross-case analysis obliges the researcher to look past initial impressions of the data and the researcher might discover new insights about the data when using multiple lenses (Eisenhardt 1989). In this study the within case analysis entails to identify and describe how values might be created by the individual firms and associated possible transaction costs. Furthermore, the cross-case analysis entails to find similarities and differences between the firms and for a multiple case study like this one, it is suitable find patterns across the firms.

3.6. Quality criteria

The trustworthiness of the study is important to acknowledge and discuss thus, to justify why readers should pay attention to the research. To attain trustworthiness

in qualitative research Lincoln & Guba (1986) proposed four types of criteria's to address. Even though these criteria's are constantly developing with time, the framework for trustworthiness have been accepted and used by many (Shenton 2004). The four criteria credibility, transferability, dependability, and confirmability are described and construed by Shenton (2004). Relevant techniques to assure trustworthiness for this study are presented in Table 2.

Table 2. Criteria's for trustworthiness in qualitative research.

	TECHNIQUES TO ADDRESS…
CREDIBILITY	Triangulation; use of different methods, different types of informants and different sites
	Tactics to help ensure honesty in informants
	Member checks
TRANSFERABILITY	Provision of background data to establish context of study and detailed description of phenomenon in question to allow comparison to be made
DEPENDABILITY	In-depth methodological description to allow study to be repeated
CONFIRMABILITY	Triangulation to reduce effect of investigator bias
	Recognition of shortcomings in study's methods and their potential effects
	In-depth methodological description to allow integrity of research results to be scrutinised

In qualitative research credibility concerns the level of consistency between the findings and reality of phenomenon (Merriam 1998) and are thus, argued to be to most essential factor for trustworthiness (Lincoln & Guba 1986). For this study, there is a lack of triangulation to ensure credibility, hence the use of different methods for collection of data is unavailable. Since no secondary data is collected e.g., documents, firm accounts, or websites, to compensate for the risk of receiving false information from the informants, it is important to acknowledge the lack of triangulation as a shortcoming of this study. However, credibility is strengthened through tactics to help ensure honesty in informants (Shenton 2004). The informants were genuinely willing to participate and since there are no right or wrong answers to the questions, see interview guide in Appendix 2, the informants were encouraged to speak openly about their own experiences. Additionally, creditability was strengthened as the informants checked the accuracy of the collected data by reading through transcriptions in both Swedish and English.

Transferability concerns the possibility to apply one study into other contexts. Since the uniqueness of contexts are inevitable in qualitative research (Bell et al. 2019), description of the contextual setting is essential. For this study, the background of all cases is thoroughly described, see chapter 4, a detailed description of the phenomenon provided, see chapter 1, as well as descriptions of how and why

methods are used within the specific context of research field. The relevant technique to address transferability provide readers a more thorough understanding of how and why conclusions have been drawn in the study. Dependability concerns if the same result would appear again if the study was accomplished once more with the same informants, methods, and contextual setting. The study provides an in-depth description of the multiple case study design, open coding, within- and cross case analysis. The in-depth description of methodological matters in combination with description of relevant contextual conditions, dependability is allowed. Confirmability concerns the importance of ensuring objectivity, meaning the rejection of the researcher's personal opinions which might influence the study. (Bell et al. 2019) Because absolute objectivity is not possible in qualitative research, triangulation is an important technique to address confirmability (Shenton 2004). However, due to the lack of triangulation in this study, the avoidance of bias from the researcher are not achieved. Although, the methodological assumptions are thoroughly described to allow others to scrutinise the results of the study.

3.7. Ethical considerations

Ethical considerations can be divided into four components as suggested by Diener & Crandall (1978) which are avoidance of harm, informed consent, privacy and preventing deception. For this study, these four ethical components are considered. The informants were voluntarily participating in the study due to their genuine interests in the research field i.e., the alternative use of meadow biomass. All informants were informed before the conducted interviews that their answers are to be recorded to enable higher quality of transcription and the informants consented. Relevant data collected from the informants was treated with care and merely the researcher had access to the material. The recorded interviews were deleted when the transcription was completed. Moreover, the informants were asked if their names are allowed to be used in the study and all informants confirmed, which imply that the principle of privacy is considered. Finally, the informants were given the transcriptions of the interviews, in both Swedish and English, to ensure that their answers had been perceived correctly and helped to prevent deception.

4. Empirical background and findings

In this chapter a description of each empirical case is presented which constitutes the empirical background. The empirical background will provide a contextual understanding of where the agricultural firms are positioned in the country and what their operational focuses are. The answers provided by the informants are representing the empirical findings. The findings are structured in subheadings in line with the theoretical framework i.e., the elements of value creation and the characteristics of transaction costs.

4.1. Caroline, Mittlandsgården, Kalmar County

In the county of Kalmar at the island Öland Caroline runs a sheep farm called Mittlandsgården. The operational focus is to produce and sell mutton- and sheepskin, as well as to produce and sell honey from own bees. Furthermore, Caroline work as an entrepreneur and has a procurement agreement with the County Administrative Board of Kalmar, which entails to maintain meadows in Oskarshamn, Nybro and Kalmar municipalities. The meadows included in the procurement agreement are about 20 hectares.

Additionally, Caroline receive Agri-environmental payments for maintenance of own meadows at approximately 5,5 hectares. All in all, about 20 tons of meadow biomass are harvested every year at these 25,5 hectares. Caroline is a biologist and emphasises that it is a waste to throw away or burn the meadow biomass, and therefore she makes use of it. All harvested meadow biomass is dried and pressed into round bales of hay to be utilized either as a supplement fodder for some of her own sheep or sold for alternative use as fodder for horses and rabbits. However, some of the meadow hay is not suitable to be sold as fodder if it contains poisonous herbs for animals e.g., lily of the valley. Therefore, the hay containing poisonous herbs is instead sold as cover material for horticulturists.

4.1.1. Value proposition

Caroline is in contact with three types of customers i.e., horse owners, rabbit owners, and horticulturists. She has regular customers, with whom she has good

relations. It seems to Caroline that customers are mainly interested in the content of the meadow hay. For example, owners of horses with laminitis are mainly interested in meadow hay as fodder to prevent the disease, while owners of islandic horses look for meadow hay as fodder since it contains low levels of crude protein. The fact that the meadow hay usually contains twigs, bushes etc., makes the meadow hay more attractive for rabbits, since they like to have something to tinker with. Additionally, meadow hay contains a rich variety of herbs which is beneficial for any animal in need of a versatile diet, and according to Caroline it seems that the animals also favour the variation of herbs.

Caroline believes that it is important to attain better knowledge of the product for it to be more successful at the market. Therefore, Caroline mentions one factor that can provide even higher added value i.e., content analysis of the meadow hay. This would give Caroline the opportunity to learn more about the product and might make it easier to find new customers. Additionally, the added value of the meadow hay is brought by the fact that no pesticides nor fertilizers has been applied to it.

4.1.2. Value creation

The management of the meadows begin early in the spring, between Mars-April, with removing twigs, branches, and leaves from the meadows. The activity is called meadow raking and can be interpreted as the same as tidying up the meadow before mowing. Caroline explains that it varies how much work the meadow raking require. Naturally, it depends on how many trees there are at the fields. Some meadows are usually covered with leaves, and those are more time consuming to rake.

The next activity is not performed until July-October when it is time for the actual mowing of the meadows. The mowing and handling of the meadow biomass is not as time consuming activity as the meadow raking. Altogether, the meadow management is labour intensive. Thus, both Caroline and her husband are involved in the meadow management and when they cannot manage alone extra employees are hired during shorter periods. She explains that the meadow management requires four to five persons during a couple of weeks. Caroline summarizes the workload as follows:

> It is a peak in Mars-April and in July-October when it is quite intense work for shorter periods of time.

The machines are important resources for the meadow management and Caroline uses a rake, tractors with beams, brush saws, swath turner and round baler. When

the meadow hay is sold, Caroline uses different channels to advertise the product i.e., Marketplace, her own Facebook page, and personal contacts. Caroline has a website designated for Mittlandsgården, and emphasises that she could potentially use this website to advertise the meadow hay, to reach new customers.

4.1.3. Value capture

According to the procurement agreement with the County Administrative Board of Kalmar regarding the meadow management, Caroline can set a fair calculated price to make profit out of the meadow management. The sold meadow hay is only a bonus-income and is not required to keep the firm running. However, Caroline explained that it feels better to make use of all the meadow hay rather than making profit from it. Caroline stated:

> It feels better to make use of the hay rather than attaining a profit from it. We do not burn or deposit the hay because we view it as a valuable resource.

Caroline charges SEK[2] 5 per kilo for the meadow hay. However, she charges different prices depending on what kind of customer is purchasing the meadow hay. Rabbit owners are charged SEK 100 per bale, horse owners SEK 40 per bale and horticulturists SEK 10-20 per bale. Caroline thinks it is important to continue maintaining meadows for the reasons of sustainability. She expressed:

> What is the alternative? Both cultural heritage and valuable species will disappear at an even greater phase if we stop maintaining meadows.

Caroline frequently communicates to customers how meadow management favours biodiversity. However, she emphasises that meadow management also contributes to the upholding of cultural heritages and traditions. Furthermore, Caroline argues that the meadow biomass is not something that should go to waste since it is a valuable resource. She stresses that there is always those who throw away harvested meadow biomass, since it might be difficult to attain provisions for it. Caroline expressed:

> Meadow biomass is often treated like waste […] If we rather could view meadow biomass as a resource, it could contribute to us managing more permanent grasslands as meadows in the future.

[2] According to Dagens industri (2022) SEK 1 is converted into EUR 0,10 and USD 0,11.

However, Caroline expresses that environmental sustainability is not the only important value for the firm to survive in the long-term, but economic, and social sustainability are also important. According to Caroline, meadow management contributes to social values. For example, Caroline values to work in a beautiful environment, raking and listening to birds. Additionally, when Caroline hires extra employees during shorter periods, she usually hires people who are newly arrived in Sweden. Caroline explains that working with meadow management is a great opportunity for people that are newly arrived, to practice language and to work in a calm environment.

The values from the alternative use of meadow biomass are summarized in Table 1 in Appendix 1. The table focuses on the elements of value proposition, value creation and value capture.

4.1.4. Information cost

Caroline explains that one of the main transaction costs corresponds to the time spent on searching for information about customers and what channels to use to find new customers. She would like to find groups of rabbit breeders or hobby horse owners at e.g., Facebook, to be able to advertise directly to these customer segments. The horse sphere is fairly new to Caroline and thus, it might be difficult to find new customers in this segment. She expressed:

> Finding customers is probably the trickiest thing, really.

Furthermore, Caroline tries to evaluate the price setting of the meadow hay. Caroline is sure that speculators of fodder, especially horse owners, frequently compare prices to find the cheapest fodder. Thus, she suspects that her pricing of the meadow hay might be too high. She expressed:

> We might be a little high in price and it is clear that customers compare prices…Horse owners might compare our meadow hay with hay from ley farming which is at a much lower price per kilo.

4.1.5. Negotiation cost

According to Caroline, negotiations do not require much labour. Because she has local customers who purchase meadow hay regularly, the exchange tends to go smoothly. Usually, the customers send her a message when they need to purchase, they collect the hay themselves, and pay the set price.

4.1.6. Monitoring cost

Caroline assumes that it would be more time efficient to sell many bales at once to one large customer, rather than sporadically selling small amounts to many customers. Caroline stated:

> It would be easier for us if one big customer purchased everything, instead of selling one bale at the time to several smaller customers. It is more time efficient to sell many bales at once.

The main transaction costs from the alternative use of meadow biomass are summarized in Table 2 in Appendix 1. The transaction costs have been evaluated from high to low to bring a clearer picture of the material.

4.2. Emma, Borgholm, Kalmar County

In the county of Kalmar at the island Öland, a bit south from Borgholm, Emma runs a sheep farm with lamb breeding as the operational focus. In addition to producing mutton- and sheepskin, the sheep also provide nature conservation by maintaining the open landscape through grazing. Emma receive Agri-environmental payments for 6,5 hectares mown meadows and it is included in the agreement that animals must graze at the meadow after the biomass has been harvested and removed from the meadow. About 6 tons of meadow biomasses are harvested every year from these 6,5 hectares.

After harvest, the meadow biomass is dried and pressed into round- and square bales of hay, to be utilized as a supplement fodder for the sheep. The smaller bales weigh about 8 kilos, while the round bales weigh about 200 kilos. When the pasture is becoming poor the meadow hay is given as a supplement fodder to the sheep. Furthermore, the lambs usually have access to a small lamb chamber and are provided with meadow ha in these. However, Emma has more meadow hay than she needs for her own animals and thus, parts of the hay are sold as fodder for horses. Emma wishes to attain provisions for everything that is produced at the farm, including the meadow biomass.

4.2.1. Value proposition

Emma is in contact with two types of customers i.e., horse owners and sheep owners. She argues that horses usually like meadow hay since it provides a variation of herbs to tinkle with. Additionally, Emma sells meadow hay occasionally to sheep

owners attending the event Fårets dagar[3]. Moreover, Emma acknowledges the possibility to sell meadow hay to rabbit owners, but she has not yet managed to find any customers within the segment. Emma has made a content analysis of the meadow hay to show the customers what the hay contains. For example, the level of crude protein versus the level cellulose. This way customers can anticipate the fodder to own needs. She explained:

> I believe it is easier to sell meadow hay if you attain a fodder analysis on it. Thus, then customers know what they are purchasing and can decide whether it is a fodder that suits them depending on what conditions and/or animals they have.

In addition, Emma stated that the added value of the meadow hay is brought by the fact that no pesticide nor fertilizers have been applied to it.

4.2.2. Value creation

The mowing of the meadow is performed from July-October. Emma usually presses the hay into square bales, but when it is possible, she uses a round baler. When it is suitable to press the hay into round bales, Emma usually asks a neighbour to help performing the task by using his round baler. She mentions that two persons are required to perform the task with a round baler. However, when Emma needs to make smaller square bales three people are required to manage the task. Emma explains:

> It is more labour intensive to make square bales rather than making round bales. Therefore, I want to make as many round bales as possible to ease the workload. It is also easier to move around few larger round bales, rather than a bunch smaller square bales.

The machines are important resources for the meadow management and Emma uses a tractor with a beam, tedder, swath turner, square- and round baler as well as a wagon. When the meadow hay is to be sold, Emma uses Blocket[4] as a channel of advertisement. However, she also uses personal contacts. The aim is to attain reoccurring customers year after year and therefore it is important for Emma to establish good relations to the customers. She expressed:

> We will see next year if the customers that I had contact with this year, will contact me directly or if I need to post an advertisement at Blocket again.

[3] The south of Kalmar County Sheep breading association arranges a three-day event, called Fårets dagar, where products related to sheep are sold at the Castle of Borgholm.
[4] Blocket is Sweden's largest digital platform for selling and buying products of all sorts.

4.2.3. Value capture

According to Emma, the Agri-environmental payments covers the costs of the meadow management. Hence, the sold meadow hay is only a bonus-income and not required to keep the firm running. Emma charges SEK 2,5 per kilo for the meadow hay. However, to make use of all the meadow hay as a resource, is not a requirement to continue with the meadow management. She stated:

> I do not need to use the harvested meadow biomass. The provision for the meadow hay is more like a bonus-income.

Even though Emma is not required to sell the hay to make the meadow management profitable, she still thinks it is important to maintain these fields which contributes to natural- and cultural values. She thinks it is problematic that there are no requirements to make use the harvested meadow biomass as a resource. She expressed:

> There is no requirement for any animals to eat the meadow biomass and it feels like a waste of the resource.

Emma also believes that social values are equally important. Emma mentions that meadow management could be suitable for "green rehabilitation", meaning that meadow management would be a good task for people who are in need of work training. She expressed:

> Working in the nature is quite unpretentious… I believe that we can keep nature in good condition, while it also contributes to the well-being of people.

The generated values from the alternative use of meadow biomass are summarized in Table 3 in Appendix 1. The table focuses on the elements of value proposition, value creation and value capture.

4.2.4. Information cost

Emma argues that it can be difficult to find customers, since the agricultural competition is quite high at Öland. She argues that the demand depends on the harvest year. In a good year of harvest, the demand for her meadow hay is not as high, as when there is lack of hay at the market. Furthermore, Emma tries to evaluate the price setting of the meadow hay, by looking at other digital ads to compare prices. Emma mentions that it is difficult to set a price since the demand for meadow hay differ from year to year and in different parts of the country. Emma

expressed that it is all about supply and demand and what people are willing to pay for the product. She expressed:

> It is all about supply and demand […] It is very difficult set a price, should I compare myself with someone down in Skåne or someone up in Norrland […] I set the price in line with what people are willing to pay for it. I think it is a lot worse not getting anything sold at all, rather than charging a high price […] As I said, I get coverage for the most essential costs through the Agri-environmental payments.

4.2.5. Negotiation cost

According to Emma, it might be tricky to decide the time for customers' collection and purchasing of the meadow hay. Emma exemplifies that everyone must be available for the loading and transporting of the hay and usually customers are only available on weekends. However, Emma thinks it is worth spending some of her free time to get the meadow hay sold. Emma thinks it is valuable to find an interested customer who wants to pay the set price.

4.2.6. Monitoring cost

Emma stated that it would be more time efficient to sell all meadow hay to one large customer, rather than several smaller customers. However, because Emma produces relatively small volumes of meadow hay it makes most sense to sell to locally anchored customers. Nevertheless, there is always a risk when selling hay because there are no guarantees to get paid by customers. She continues with arguing that it is even a larger risk selling hay to new customers. However, Emma emphasises her urge to make use of the meadow hay as a resource and thus, it is worth the chance of not getting paid.

The main transaction costs from the alternative use of meadow biomass are summarized in Table 4 in Appendix 1. The transaction costs have been evaluated from high to low to bring a clearer picture of the material.

4.3. Per, Hjälmö, Stockholm County

In the county of Stockholm, at the island Hjälmö, Per runs a small farm part- time, while working as a supervisor at a nature reserve in the Stockholm archipelago. He mentions that the farm is too small to be run full-time and thus, it is appropriate to combine the farming with being a supervisor at the nature reserve. The operational focus at the farm is partly to produce and sell mutton- and sheepskin, partly to keep the landscape open through grazing. At the farm there are 45 ewes and 5 cows that

graze approximately 10 islands around the archipelago during the summer. Per works continuously with transporting the animals between the islands by ferry. Naturally, much of the fodder is produced at the farm through ley farming. However, Per is also receiving Agri-environmental payments for mown meadows at the island Gränö at about 6-7 hectares.

The meadow at Gränö is usually mowed at the end of July, to let the herbs seed of. However, this means that the meadow biomass might become dry and coarse. The harvested volumes of meadow biomasses can vary greatly from one year to another, depending on how much it rains. Per mentions that on such lean fields one can observe a major difference in harvested volumes depending on if there is dry year or not. Per exemplifies his statement by explaining that in the dry-year of 2018 about 9 bales of hay were harvested at Gränö, while approximately 60 bales of hay were harvested in 2020 and about 30 bales were harvested in 2021.

The harvested meadow biomass from Gränö is dried and pressed into round bales, weighing around 200 kilos each, to be utilized as a supplement fodder for the lambing sheep and calving cows. The lambs and calves are also given the meadow hay and it seems that the animals prefer the meadow hay. The meadow hay that is harvested at Gränö is mainly used as fodder for own animals. However, the hay is occasionally sold to farmers nearby who need a supplement fodder for beef cattle.

4.3.1. Value proposition

Per uses the meadow hay mainly as fodder for his own animals, but occasionally meadow hay is sold to neighbouring agricultural firms. Per is determined that it is favourable for any animal to eat hay that contain various kinds of species in the flora. He believes that animals might stay healthier if meadow hay is added to their diet and explains that he never had a problem with diseases for any of his animals. Per expresses that other farmers nearby speak little about the importance of the species rich variety of herbs in hay and he believes that this could be an argument of sale. Per mentions that additional added value for the meadow hay is that no fertilizers nor pesticides are applied to it. The meadow hay from Gränö is mainly given to own sheep as supplement fodder during the winter months. Thus, Per argues that the meadow hay increase the value of the mutton- and sheepskin products. Per explained:

> Customers are not only interested in the fact that our animals graze the islands, but they are also curious about the mown meadows […] we usually try to communicate to customers how the meadow management contributes to natural- and cultural values. However, we could communicate about these things even more to increase the added value of our mutton- and sheepskin products.

4.3.2. Value creation

The mowing of the meadow at Gränö is performed in the end of July. Per expresses that it is efficient to make round bales wrapped into plastic, thus the plastic wrappings preserve the moist hay. Two persons are required to perform the meadow management, including the handling of the hay. The machines are important resources for the meadow management. Per uses a tractor with a beam, tedder, swath turner, round baler, and wagon. When the meadow hay is to be sold personal contacts are used as the main channel of advertisement.

4.3.3. Value capture

According to Per the Agri-environmental payments cover the costs of the meadow management, but he does not make any profit on the meadow management. When the meadow hay is to be sold, Per charges SEK 1 per kilo for the meadow hay. Although, he reflected up on that the set price might be too low:

> When I think about it, I could charge more for the meadow hay since it is quality-enhancing. However, in this case I am not sure if the customers are aware of the added value of the meadow hay.

Even though the meadow management is not profitable, Per continues with the meadow management at Gränö because he urges to maintain natural- and cultural values. However, Per made it clear that it is important not spending too much time on an activity that does not generate any profits. He expressed:

> Unfortunately, no matter how much you are passionate about something, you must also earn money to be able to sustain. It is not possible to spend too much time on something that does not generate any money.

However, Per thinks it is important to use the meadow hay as a valuable resource. He also argued that customers are willing to pay a higher price for his mutton- and sheepskin products, partly because of the meadow management.

The generated values from the alternative use of meadow biomass are summarized in Table 5 in Appendix 1. The table focuses on the elements of value proposition, value creation and value capture.

4.3.4. Information cost

Per explains that there is a balance between the number of animals, areas of pastures, and amount of fodder produced at his farm. Per argued that he uses most

of the fodder produced at the farm for own animals. However, as he occasionally sells meadow hay to neighbouring agricultural firms in need of a supplementary fodder, the customers make sure to contact Per.

4.3.5. Negotiation cost and monitoring cost

When meadow hay is to be sold, some logistics are required to transport the hay to the customer. For example, Per described that it requires some time and labour in connection to the transporting of purchased meadow hay. Furthermore, the question regarding monitoring costs was not thoroughly answered by Per.

The main transaction costs from the alternative use of meadow biomass are summarized in Table 6 in Appendix 1. The transaction costs have been evaluated from high to low to bring a clearer picture of the material.

4.4. Karen, Ingarö, Stockholm County

In the county of Stockholm, at the island Ingarö, Karen runs a small farm part- time, while working as a supervisor at a nature reserve in the Stockholm archipelago. Karen emphasises that the farm is too small to be run full-time, even if Karen would want to. The operational focus is board-and-lodging for horses in combination with ley farming. The farm is divided in small and scattered lots and surrounded by impediments, which is making the agriculture somewhat irrational. For about 30 years Karen, and her father before her, has been maintaining a meadow at the request of a plot association nearby. The meadow is not more than an acre, about 3-4 thousand square meters. However, Karen has continued to maintain the meadow for a long time to keep the landscape open and to make use of the harvested biomass. About 1 ton of meadow biomass is harvested from the meadow in a good year. After harvest, the meadow biomass is handled manually through putting on frame for drying. When it is dry enough the hay is pressed into square bales of hay and used as fodder for own horses at the farm. The meadow hay that is not utilized at the farm, is sold locally as fodder for horses, rabbits, or guinea pigs.

4.4.1. Value proposition

Karen is in contact with three types of customers i.e., horse owners, rabbit- and guinea pig owners. Karen explains that she has regular customers, with whom she has good relations. The content of the meadow hay seems to arouse the interest of the customers. Some purchase her meadow hay for horses with stomach problems or that are sensitive for dust. She states that many hobby horses are fed with fodder which contains too much crude protein and continues to argue that meadow hay is a good fodder for hobbyhorses. Karen is mowing the meadow in late summer to

attain lower levels of crude protein and higher levels of cellulose. She argued that the coarse meadow hay provides more chewing time and are thus, beneficial for horses' welfare.

According to Karen, it is obvious that both horses, rabbits and guinea pigs favour the meadow hay as fodder, partly because of the rich variety of herbs. Sometimes Karen mixes the meadow hay with ley hay for her own horses and the horses always peel out the meadow hay first. Karen mentions that many rabbit- and guinea pig owners purchase her meadow hay mainly because of the content and thus, Karen can charge a high price for it. The added value is also brought by the fact that no pesticides nor fertilizers have been applied to the meadow hay. Putting on frame contributes to a better quality of the hay. For example, the harvested vegetation is only turned once which contributes to less dust in the hay and putting on frame helps it to stay green for longer. Moreover, managing the hay manually is making it easier for Karen to detect eventual defects in the hay i.e., mould, soil, or large twigs, and remove it before baling. It can be seen as an extra quality check of the hay.

4.4.2. Value creation

The mowing is performed in the end of July and turned once before the meadow hay is put on frame. When the hay is dry enough, it is removed from the frame and pressed into square bales. Because many tasks are performed manually e.g., putting on frame, the meadow management is rather labour intensive. Family, friends, and neighbours help with the meadow management, without them it would not be possible to perform. Today, putting on frame is not a rational method and thus, Karen explained that about five to ten persons are required to perform the task. Karen continues describing that even though the harvest of the meadow is time consuming, she does it for the sake of tradition. The machines are important resources for the meadow management and Karen use a tractor with a beam, tedder, swath turner and square baler. Karen sells the meadow hay to regular and reoccurring customers. She is not required to advertise the product at any digital channel to get it sold, instead the word about the product has been spread mouth to mouth through personal contacts.

4.4.3. Value capture

According to Karen, the Agri-environmental payments cover the costs of the meadow management. Today, Karen charges SEK 6,5 per kilo meadow hay to horse owners, while rabbit- and guinea pig owners are charged SEK 35 per kilo.

Karen mentions that some speculators think it is too expensive, while others want to purchase it because of the good quality. Karen stated:

> My meadow hay is expensive, but it is high quality.

Karen explains that it would be more profitable if all meadow hay was sold as rabbit- and guinea pig fodder, for SEK 35 per kilo. However, this is not the case. She sells a few bales meadow hay to rabbit- and guinea pig owners every year, although it is not much. Karen expressed that the meadow management is not profitable, but she continues with the management for other reasons than earning money. She stated:

> The neighbours are included and engaged in the meadow management. There is a community around it all. We arrange a little harvest party when we are done. The social and environmental values are more important than the economic values.

Karen made it clear that all meadow biomass harvested at her farm is seen as a valuable resource. However, she expressed her sympathy for those who cannot use all meadow biomass if they cannot attain a provision for it. She emphasised that it is important to have a local market for the meadow biomass, since it is difficult to compete with ley farming charging between SEK 1,80-2 per kilo. She stated:

> No matter how much Agri-environmental support you receive, you can never compete with large-scale ley farming. It is not possible with meadow hay because those areas of meadows do not exist.

The generated values from the alternative use of meadow biomass are summarized in Table 7 in Appendix 1. The table focuses on the elements of value proposition, value creation and value capture.

4.4.4. Information cost

Karen does not have to spend time looking for new customers, instead customers rather find her. She explained that because the farm is run part-time and she must work as a supervisor daily, there is not much time left for advertising the meadow hay to new customers. If she had more time, she would advertise the meadow hay mainly towards rabbit- and guinea pig owners, to sell it for a higher price. However, it is more convenient and less time consuming when customers reach out to Karen. Karen also thinks that larger volumes of meadow hay are required for it to be worth the effort to search for new customers herself.

4.4.5. Negotiation cost and monitoring cost

The customers come to the farm to collect and purchase the meadow hay. The customers weigh the hay themselves and pay the set price. According to Karen, this requires only a few minutes of work. Furthermore, every transaction with each customer must be booked individually, which often can be time consuming. According to Karen, the bookkeeping would be less time consuming if she sold meadow hay to one large customer, rather than sporadically selling smaller amounts of meadow hay to several smaller customers.

The main transaction costs from the alternative use of meadow biomass are summarized in Table 8 in Appendix 1. The transaction costs have been evaluated from high to low to bring a clearer picture of the material.

5. Analysis

In this chapter the empirical findings are categorised through open coding, which creates the departure of analysis. The categories are analysed in line with the synthesis of theoretical framework and begins with a within case analysis of the cases. Second, the analysis is constituted by a cross-case analysis to find patterns across the cases. Finally, the synthesis of analysis is presented and illustrates the relationship between the elements of generated values and the characteristics- and attributes of transaction costs. All in relation to the alternative use of meadow biomass.

5.1. Within case analysis

The categorisation of empirical findings through open coding provides a point of departure for the analysis. The coding is presented in Table 9 and 10. The within case analysis is based on the theoretical framework introduced by Bocken et al. (2014) and Hobbs (1996), see Figure 2, 3, and 4. The analysis considers how the cases might create value in the potential market for meadow biomass through a SBM archetype. Table 9 presents all generated value flows accomplished by each agricultural firm concerning the meadow biomass. Furthermore, the analysis considers what possible transaction costs are impeding each individual firm's development at the market for meadow biomass. Table 10 presents the possible transaction costs regarding the alternative use of meadow biomass. The transaction costs in Table 10 are ranked from high (the transaction is classified as high in cost), medium (the transaction is classified as medium in cost), or low (the transaction is classified as low in cost).

Table 9. Generated value flows. All counties.

	CAROLINE **KALMAR COUNTY**	**EMMA** **KALMAR COUNTY**	**PER** **STOCKHOLM COUNTY**	**KAREN** **STOCKHOLM COUNTY**
VALUE PROPOSITION				
CUSTOMER SEGMENTS	Horse owners, Rabbit owners, Horticulturists	Horse owners, Sheep owners, potentially rabbit owners	Neighbouring farms with beef cattle	Horse owners, Rabbit owners, Guinea pig owners
PRODUCT	Customers interested in content of the meadow hay	Customers interested in content of the meadow hay	N/A	Customers interested in the content of the meadow hay
	N/A	Offer customers a content analysis of the meadow hay	N/A	N/A
	No fertilizers nor pesticides applied	No fertilizers nor pesticides applied	No fertilizers nor pesticides applied	No fertilizers nor pesticides applied
	Rich variety of herbs	Rich variety of herbs	Rich variety of herbs	Rich variety of herbs
	N/A	N/A	Mutton- and sheepskin products attain a higher value	N/A
RELATIONSHIPS	Regular customers, good relations	Not yet an established customer base	Sells meadow hay occasionally to neighbouring farms	Regular customers, good relations
VALUE CREATION				
KEY ACTIVITIES	Meadow raking (Mars- April)	N/A	N/A	N/A
	Mowing (July- October)	Mowing (July- October)	Mowing (end of July)	Mowing (end of July)
	Round bales	Round bales, Square bales	Round bales	Square bales
RESOURCES	Labour: Four to five persons	Labour: Two to three persons	Labour: Two persons	Labour: five to ten persons
	Extra employees during shorter periods	Hire a neighbour to performed pressing of round bales	N/A	Attain help from family and neighbours
	Rake, tractors with beams, brush saws, swath turner and square baler, wagon	Tractor with a beam, tedder, swath turner, square- and round baler, wagon	Tractor with a beam, tedder, swath turner, square- and round baler, wagon	Tractor with a beam, tedder, swath turner, square baler, wagon

CHANNELS	Facebook-Marketplace, Own Facebook page, Personal contacts, own website might potentially be used in the future	Blocket, Personal contacts	Personal contacts	Personal contacts
PARTNERS	Procurement with the County Administrative Board of Kalmar	N/A	N/A	N/A
	CAROLINE **KALMAR COUNTY**	**EMMA** **KALMAR COUNTY**	**PER** **STOCKHOLM COUNTY**	**KAREN** **STOCKHOLM COUNTY**
VALUE CAPTURE				
COST STRUCTURE & REVENUE STREAMS	Profitable (with the procurement agreement Caroline can set a fair calculated price)	Profitable (the Agri-environmental payments covers the costs of the meadow management)	No profit nor loss (the Agri-environmental payments covers the costs of the meadow management)	No profit nor loss (the Agri-environmental payments covers the costs of the meadow management)
	The sold meadow hay generates a bonus-income	The sold meadow hay generates a bonus-income	The sold meadow hay generates a bonus-income	The sold meadow hay generates a bonus-income
	Charge SEK 5 per kilo for the meadow hay	Charge SEK 2,5 per kilo for the meadow hay	Charge SEK 1 per kilo for the meadow hay	Charge SEK 6,5 per kilo to horse owners Charge SEK 35 per kilo to rabbit- and guinea owners
CONTRIBUTION TO ENVIRONMENT & SOCIETY	Natural- and cultural values	Natural- and cultural values	Natural- and cultural values	Natural- and cultural values
	Valuable resource	Valuable resource	Valuable resource	Valuable resource
	Traditions	N/A	N/A	Traditions
	Recreation	N/A	N/A	N/A
	Employer for people that are newly arrived	Green rehabilitation	N/A	Community of family and neighbours

5.1.1. Value proposition

Customer segments

The customer segments are related to what kind of value is delivered to customers (Richardson 2008). Since the firms approach different type of customer segments, the delivered value to customers might vary. The empirical data shows that Caroline approaches owners of horses, rabbits, and horticulturists. Emma approaches owners of horses, sheep and aims to approach rabbit owners in the future. Per approaches neighbouring agricultural firms in need of a supplement fodder, while Karen approaches owners of horses, rabbits, and guinea pigs.

Product

The product relate to what kind of value is delivered to customers, what customers are willing to pay for it, and the competitive advantage of the firm (Richardson 2008). It is showed from the empirical data that various value flows are generated through the alternative use of meadow biomass. Caroline's customer base value the nutritional content of the meadow hay since it helps prevent laminitis for horses, it contains lower levels of crude protein which is favourable for islandic horses and rabbits seem to like the twigs and bushes that comes with the meadow hay. Emma argues that horses usually like meadow hay since it provides a variation of herbs to tinkle with. Karen's customer base gives the meadow hay to horses with stomach problems or horses sensitive to dust. Additionally, Karen stated that rabbit- and guinea pig owners purchase her meadow hay mainly because of the content of the fodder and thus, she can charge a high price for it.

Emma offers to provide a content analysis of the meadow hay to customers. The analysis might be a competitive advantage for the firm, in line with Richardson (2008) since it makes it possible for customers to anticipate the meadow hay to own needs. Caroline emphasises that through a content analysis of meadow hay, she could learn more about the product and thus, it might become easier to find new customers. Another kind of value delivered with regards to the content of the meadow hay, which all informants agree on, is that no fertilizers nor pesticides is applied to the meadow hay and the meadow hay contains a rich variety of herbs.

The alternative use of meadow hay could also deliver value to customers indirectly. According to Per, the mutton- and sheepskin products attain a higher value when the sheep are fed with meadow hay during the winter months and thus, customers are willing to pay a higher price for these products. Although, indirect values delivered from the alternative use of meadow hay could be communicated even

more to customers, to increase the competitive advantage of the firm, in line with Richardson (2008).

Relationships

Relationships are related to the competitive advantage of the firm (Richardson 2008). Both Caroline and Karen have regular customers with whom they have good relations. Emma, on the other hand has not yet managed to establish a customer base of regular customers. Per does not have any regular customers since he only sells meadow hay occasionally.

5.1.2. Value creation

Key activities

Key activities are related to the creation of value to customers (Richardson 2008). The firms create value through the meadow management and deliver value to customers through harvest of meadow hay. However, the meadow management differ amongst the firms. Caroline performs meadow raking in early spring, while the other firms exclude this activity completely. The mowing is performed between July-October by Caroline and Emma, while it is performed at the end of July by Per and Karen. The pressing of meadow hay into bales varies amongst the firms. Caroline presses into round bales, Emma presses into round- and square bales, Per presses into round bales, while Karen press into square bales.

Resources

Resources are related to the creation of value to customers (Richardson 2008). One important resource needed to create the meadow hay is labour. However, the labour varies amongst the firms. Caroline needs four to five persons, Emma needs two to three persons, while Per needs two persons, and Karen needs five to ten persons, to transform the meadow biomass into hay. Furthermore, Caroline hires extra employees during shorter periods of time, while Emma occasionally hires a neighbour to perform the pressing of round bales. Karen attains help from family and neighbours to perform the meadow management and handling of hay. The machines are important for the value creation to customers and seem to be similar in all cases.

Channels and partners

Channels relates to the delivery of value to customers (Richardson 2008). Caroline uses various channels to reach customers of meadow hay including Marketplace, her own Facebook page, personal contacts, and aims to advertise the meadow hay at her own website in the future. Emma use Blocket as the main channel to reach customers, but also personal contacts. Per and Karen only utilize personal contacts.

Partners relate to the creation and delivery of value through new business opportunities, new markets or new revenue streams (Beltramello et al. 2013). Caroline has managed to sieze a new business opportunity and revenue streams through making a procurement agreement with the County Administrative Board of Kalmar.

5.1.3. Value capture

Cost structure and revenue streams

The cost structure and revenue streams relate to the capturing of value through product provisions (Bocken et al. 2014; Teece 2010), hence the profit margins must be greater than costs (Richardson 2008). The meadow management is profitable for Caroline because of the procurement with the County Administrative Board of Kalmar. The meadow management is also profitable for Emma because of the Agri-environmental payments. For both Per and Karen the meadow management generates neither profit nor loss, even though they receive Agri-environmental payments for mown meadows. It is shown that the sold meadow hay only generates a bonus-income for all firms, meaning that the provisions from the meadow hay are not a significant income, it is rather the Agri-environmental payments or the procurement agreement that are of importance. The firms charges different sums for the meadow hay they sell. Caroline charges 5 SEK per kilo, Emma charges SEK 2,5 per kilo, Per charge SEK 1 per kilo, while Karen charges SEK 6,5 per kilo for horse owners and SEK 35 per kilo for rabbit- and guinea pig owners. Caroline charges SEK 100 per bale for rabbit owners, SEK 40 per bale for horse owners and SEK 10-20 per bale for horticulturists.

Contribution to environment and society

Contribution to environment and society relates to the reduction of environmental costs through transformation of what are precieved to be waste into value and thus, contribute to positive consequenses for society (Bocken et al. 2014). According to all informants the meadow management reinforce natural and cultural values in the agricultural landscape. Caroline and Karen also emphasise that the meadow management contribute to the upholding of traditions. It is shown that all informants view the meadow hay as a valuable resource that should not go to waste. This relates to Bockens et al. (2014) SBM archetype, where the elimimiation of waste to be transformed into other production is essential. Additionally, Caroline thinks the meadow management provide social values of recreation, while Karen thinks it contributes to a community since her familiy and neigbours are interested and engaged in the meadow management. It is also shown that the meadow management can provide work for people that are newely arrived and can work as green- rehabilitation for people.

5.1.4. Possible transaction costs

Information cost

Information cost relates to the costs of searching for information about products, the pricing of products and finding buyers (Hobbs 1996). It is showed from the empirical findings that it can be difficult to find new customers. Caroline thinks that one of the most time consuming activities is to search for information about finding new customers of meadow hay, meaning that the information cost can be classified as high. Furthermore, Caroline's frequent evaluation of the price is based on uncertainty of what prices customers expect in relation to what they pay for hay coming from ley farming. Hence, the malfunctioning communication between the trading parties can be the reason for uncertainty (Williamson 1979). The information cost about pricing of products can therefore be classified as high.

Emma thinks it is difficult to find customers due to the high competition of agricultural firms at Öland. Because the harvest year affects supply and demand of meadow hay, Emma possesses incomplete information about products and prices and thus, experiences market uncertainty, in line with Williamson (2008). Emma thinks it is difficult to evaluate her price setting of meadow hay since demand might differ from year to year and in differing parts of the country. Information costs can therefore be classified as high. In the case of Per the information costs can be classified as low since Per only sells meadow hay when neighbouring agricultural firms need supplementary fodder and at those occasions customers make sure to contact Per. Hence, Per is not required to make any efforts in searching for information about products, prices or finding customers. Because Karen has another job, in addition to running the farm part-time, it is much more convenient for Karen when customers contact her and hence, no efforts are put on finding customers.

Negotiation cost

Negotiation cost arises when making the physical agreement by writing contracts or negotiating about contracts (Hobbs 1996). According to Caroline, customers' collection and purchasing of meadow hay do not require much labour because customers are reoccurring. Since frequent transactions contribute to lower transaction costs (Riordan & Williamson 1985), negotiation costs can be classified as low, in the case of Caroline. In the case of Emma, customers' collection and purchasing of products are often labour intensive in terms of logistics. However, Emma still thinks it worth the effort and the negotiation cost can be classified as medium. In the case of Per, customers' collection and purchasing of meadow hay are often labour intensive in terms of logistics and thus, the negotiation cost can be classified as medium. According to Karen, customers' collection and purchasing of meadow hay do not require much labour because the customers are reoccurring and

since frequent transactions contribute to lower transaction costs (Riordan & Williamson 1985), negotiation cost can be classified as low, in the case of Karen.

Monitoring cost

The monitoring cost considers the costs of making sure the agreement is fulfilled by all parties ex post the transaction (Hobbs 1996). According to Caroline, Emma, and Karen it would be more time efficient selling larger amount of meadow hay to one large customer, rather than sporadically selling smaller amounts to several smaller customers. Karen urges the fact that the accounting and bookkeeping is more time-consuming when she has several smaller customers, rather than if she would have one large customer. Furthermore, according to Emma there is no guaranties that customers will pay, especially when it concerns to new customers. This is a form of uncertainty (Williamson 1979), which might result in imperfect contracts.

Table 10. Possible transaction costs. All counties.

	CAROLINE	EMMA	PER	KAREN
INFORMATION COSTS	Time spent on finding customers Evaluation of price	Time spent on finding customers Evaluation of price	Time spent on finding customers	Time spent on finding customers
LEVEL	High	High	Low	Low
NEGOTATION COSTS	Collection and purchasing	Collection and purchasing	Collection and purchasing	Collection and purchasing
LEVEL	Low	Medium	Medium	Low
MONITORING COSTS	Several smaller customers	Several smaller customers No guarantees customers will pay	N/A	Several smaller customers
LEVEL	Medium	Medium	N/A	Medium

5.2. Cross case analysis

The cross-case analysis is based on the theoretical framework introduced by Bocken et al. (2014) and Hobbs (1996), see Figure 2, 3 and 4. The analysis considers what similarities and differences there are in terms of generated values in the potential market for meadow biomass through the SBM archetype. Table 11 presents the similarities and differences in generated value flows. Furthermore, the analysis considers what possible transaction costs are impeding firms' development in the market for meadow biomass. The generated characteristics- and attributes of the transaction costs are compared between the cases. Additionally, the average level of classification of the transaction costs is presented in Table 12.

Table 11. Similarities and differences in generated values.

	SIMILARITIES	DIFFERENCES
VALUE PROPOSITION		
CUSTOMER SEGMENTS	Horse owners, Rabbit owners	Horticulturists, owners of guinea pigs, sheep, and beef cattle
PRODUCT	The nutritional content of the meadow hay No fertilizers nor pesticides applied Rich variety of herbs	Content analysis of the meadow hay Mutton- and sheepskin products attain a higher value
RELATIONSHIPS	Regular customers	Not established customer base Not relevant to have regular customers
VALUE CREATION		
KEY ACTIVITIES	Mowing in late summer Round bales	Meadow raking Putting on frame
RESOURCES	Machines Labour	Varying amount of labour
CHANNELS	Personal contacts Digital channels	N/A
PARTNERS	N/A	Procurement agreement
VALUE CAPTURE		
COST STRUCTURE & REVENUE STREAMS	Agri- environmental payments Bonus-income	Differences in pricing of meadow hay
CONTRIBUTION TO ENVIRONMENT & SOCIETY	Natural- and cultural values Valuable resource Traditions Social values	N/A

5.2.1. Value proposition similarities and differences

Customer segments

The similarities regarding customer segments and what kind of values are delivered to customers (Bocken et al. 2014) are that three out of four cases sell meadow hay to horse owners and two out of four cases sell meadow hay to rabbit owners. One of the four cases intends to start selling meadow hay to rabbit owners. The differences with regards to customer segments are that one out of the four cases sell meadow hay to horticulturists as cover material, one to guinea pig owners, one to sheep owners and another to owners of beef cattle.

Product

The similarities with regards to the product are that in three out of four cases customers show interest towards the nutritional content of the meadow hay, which constitutes a value to delivered customers. (Richardson 2008) Furthermore, one out of four cases offer to provide content analyses of the meadow hay to customers, which might be a competitive advantage for the firm. Additional similarities are

that in all cases no fertilizers nor pesticides is applied to the meadow hay, which constitutes a value delivered to customers. Also, in all cases value are delivered to customer through the rich variety of herbs in the meadow hay. Another difference is that mutton- and sheepskin products indirectly attain a higher economic value when the sheep are fed with meadow hay.

Relationships

The similarity with regards to relationships is that two out of four cases have regular customers that they have good relations with, which can bring competitive advantages (Richardson 2008). The differences are that in one case no established or regular customers are at hand, while in another case it is not relevant to have regular customers since most of the hay is needed for own animals.

5.2.2. Value creation similarities and differences

Key activities and resources

In one out of four cases meadow raking is performed in early spring, while the other cases exclude this activity completely. However, the mowing of meadows is performed in late summer by all cases, which constitutes a similarity. Another difference is that one out of four cases use the method of putting on frame, whilst the other cases exclude this activity completely. Additional similarities are that in three out of four cases the hay is pressed into round bales. The cases need varying numbers of workers for the meadow management. In two out of the four cases extra employees are hired during shorter periods of time, while one of the cases receive help from family and neighbours. Furthermore, resources which are similar in all cases are the machines.

Channels and partners

Similarities with regards to channels are that in all cases personal contacts are an important channel for the sale of meadow hay. In addition, two out of four cases use digital channels to advertise the meadow hay. However, the differences are found in the use of different digital channels. In one out of the four cases Blocket is used as a digital channel, while in another case Facebook is used as a digital channel. One difference with regards to partners is that one out of four cases sieze a new business opportunity and revenue streams (Beltramello et al. 2013) through a procurement agreement. This might be in line with Prahalad & Ramaswamy (2004)., suggesting that co-creation between stakeholders can make value capture more successful.

5.2.3. Value capture similarites and differences

Cost structure and revenue streams

Similarities as regards to cost structure and revenue streams are that in three out of four cases the Agri-environmental payments for mown meadows cover the costs of the meadow management. Additionally, in all the four cases it is shown that the sold meadow hay merely generates a bonus-income. In addition, there are differences in the pricing of the meadow hay.

Contribution to environment and society

In all cases the reinforcement of natural- and cultural values are created through the meadow management. In two out of four cases value is captured through the upholding of traditions with regards to the meadow management and alternative use of the meadow hay. Moreover, in all cases the meadow hay is viewed as a valuable resource. Finally, in three out of the four cases it is argued that meadow management provide social values i.e., communites, work for people that are newely arrived and work for people in need of green-rehabilitation.

5.2.4. Comparison of possible transaction costs

Information, negotiation, and monitoring cost

Since two out of four cases spend time on finding customers, while the other two spend little to no time on finding customers, the average classification of information cost with regards to finding customers is medium. Since two out of four cases spend time on evaluating price, the average classification of information cost with regards to evaluating price is high. Since two out of the four cases view the collection and purchasing of meadow hay to be labour intensive, while the other two have reoccurring customers making the collection and purchasing undemanding, the average classification of negotiation cost is low/medium. Since two out of the four cases claim that it would be more time efficient selling meadow hay to one large customer rather than several smaller customers, the average classification of monitoring is medium. Moreover, since one out of four cases stated that it is no guaranties customers will pay, the average classification of monitoring cost is medium.

Table 12. Comparison of possible transaction costs.

	AVERAGE LEVEL	POSSIBLE TRANSACTION COSTS
INFORMATION COSTS	Medium High	Time spent on finding customers Evaluation of price
NEGOTATION COSTS	Low/ Medium	Collection and purchasing

MONITORING COSTS	Medium	Several smaller customers No guarantees customers will pay

5.3. Synthesis of analysis

The result from the analysis provides interesting insights regarding patterns of how values are created by firms though the alternative use of meadow biomass. The result from the analysis also shows what possible transaction costs are impeding firms' ability to develop in the market. The synthesis of the analysis is presented in Figure 6, which displays the relationship between the elements of value described by Bocken et al. (2014) and characteristics of transaction costs described by Hobbs (1996). In the synthesis of analysis weight is mainly put on the similarities of generated values from the cross-case analysis to discover important patterns from the empirical findings. However, some of the differences are also important to consider in the synthesis of analysis since these also might contribute to knowledge development.

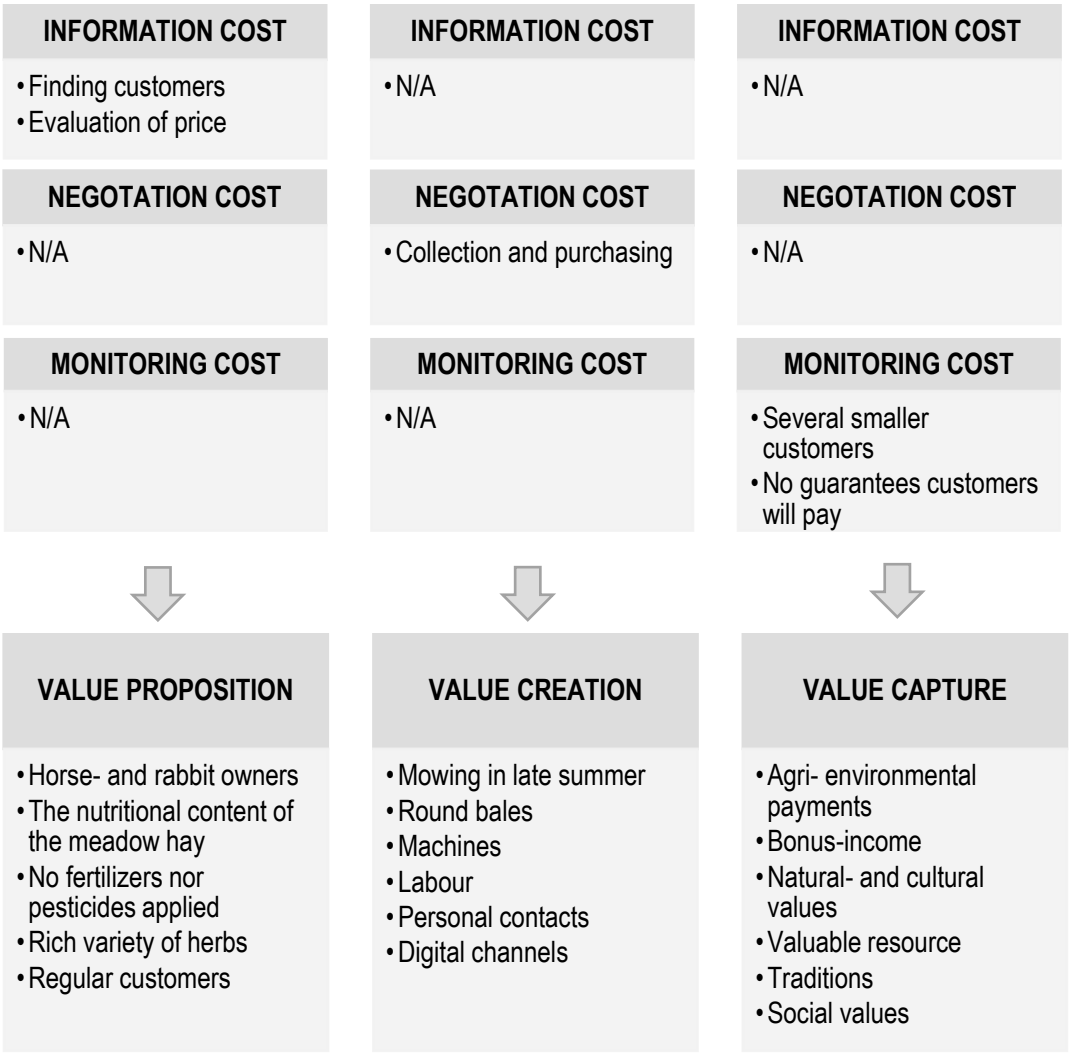

Figure 6. Synthesis of analysis. (Own processing).

6. Discussion

In this chapter a discussion and critical reflection of the synthesis of analysis are provided. The discussion will also show how the results are related to background and literature of the thesis. The departure of the discussion is based on the research questions (I) How might firms create value in the potential market for meadow biomass through a sustainable business model archetype, and (II) What are the possible transaction costs impeding firms' development in the market for meadow biomass?

Meadow biomass is often perceived as waste since it is frequently deposited at the edge of the fields (Gyldberg & Stenmark 2015) and handled as a by-product of nature conservation for preservation of biodiversity (Sveriges Radio 2021). However, the recent attention towards the alternative use of meadow biomass (Länstyrelsen Värmland 2021; Ström 2006; Naturvårdsverket 2015) displays the motivation to make use of the resource. Furthermore, there is an expressed urgency for the increased profitability concerning meadow management to enable agricultural firms to maintain larger areas of meadows in the future (Naturvårdsverket 2020a). The alternative use of meadow biomass can be perceived as a business opportunity for agricultural firms to attain additional revenue. This study provides insights of how economic, environmental, and social values are created from the alternative use of meadow biomass, as well as what possible transaction costs are relevant. Due to the lack of other studies regarding the SBM archetype and transaction costs related to the alternative use of meadow biomass, this study acts as an initial study to fill a gap in literature.

6.1. Value flows in the market for meadow biomass

The SBM archetype is perceived to have great potential of incorporating sustainability aspects into a business model, as suggested by Boons & Lüdeke-Freund (2013). The empirical findings of this study indicate that sustainability aspects are incorporated in the investigated firms' proposition, creation and capturing of value regarding alternative use of meadow biomass. The empirical findings also indicate that it is possible to incorporate environmental and social aspects, in concert with economic facets into a business model, as suggested by

Bocken et al. (2014), even though the meadow biomass only generates a bonus income. The empirical findings identified important patterns of how value flows are created by the studied cases in the market for meadow biomass which are presented in Figure 6.

6.1.1. Value proposition

The findings identified that horse- and rabbit owners are the main customer segments approached by the studied firms. Horticulturists, owners of sheep, guinea pigs and beef cattle are also approached customer segments but not as commonly as horse- and rabbit owners. Meadow hay could also be suitable as fodder for suckler cows, heifers, dry cows, and sheep as suggested by Svensson & Moreau (2012), however, the empirical findings indicate that horse-and rabbit owners are the most important customer segments for the alternative use of meadow biomass.

The approached customers segments determine what values might be delivered to customers (Richardson 2008) and the empirical findings identified that the nutritional content is an essential added value to customers, especially to horse- and rabbit owners. This can partly be explained by the low levels of crude protein in meadow hay, which constitutes a suitable fodder for horses as suggested by Svensson & Moreau (2012). Furthermore, the findings identified that it could be a competitive advantage (Richardson 2008) for the firms to offer a content analysis of the meadow hay. Hence, by providing concrete numbers of nutrition- and mineral values in the meadow hay, as advocated by Drakenberg & Tikka (2020), could enable customers to anticipate the meadow hay to own needs.

The absence of fertilizers and pesticides applied to meadow hay generate value for customers, as well as the rich variety of herbs generates value for owners of horses, rabbits, and sheep. The rich variety of herbs in fodder can help animals attain a healthy fatty acid composition and thus, has a positive effect on the quality of the meat as suggested by Världsnaturfonden (2014). Therefore, the identified value can potentially be relevant for all customer segments, but especially for customers with meat producing livestock i.e., beef cattle or sheep. For example, one of the studied firms is attaining higher economic value for mutton- and sheepskin products when the sheep are fed with meadow hay during the winter months. Even though the increased economic value of the mutton- and sheepskin products can be viewed as an indirect value delivered to customers. This type of alternative use of meadow hay has the potential to be communicated to customers and hence increase the competitive advantage of the firm (Richardson 2008).

The findings identified that firms' having regular customers might attain a competitive advantage in line with Richardson (2008) since customers come back

to purchase meadow hay year after year. However, the findings also identified that some firms do not find it relevant to have regular customers since most of the hay are given to own animals. Therefore, it might be reasonable to suggest that the firm's geographical location, operational focus, areas of meadows and capacities to handle the meadow hay determine the relevance of having regular customers.

6.1.2. Value creation

The findings identified that mowing is performed in late summer by all cases. The late mowing affects the meadow hay to contain lower levels of crude protein and higher levels of cellulose which are beneficial for horses and sheep as suggested by Svensson & Moreau (2012). The late mowing is therefore argued to create value for some customers (Richardson 2008). Additionally, the empirical findings identified that it seems to be more efficient to press the meadow hay into round bales rather than square bales.

It is identified from the findings that both labour and machines are important resources for the meadow management and hence, the value creation for customers (Richardson 2008). However, the firm's geographical locations, operational focus, areas of meadows and capacities to handle the meadow hay are important factors determining how much labour is needed for the meadow management. In addition, the findings identified that both personal contacts and digital advertisement are important channels for the sale of meadow hay and thus, the delivery of value to customers (Richardson 2008). However, it might be reasonable to suggest that there is a need for a common digital platform to facilitate a venue for sellers and buyers, similarly to the digital platform of Swedish wool (Ullförmedlingen 2018).

The findings identified that one of the cases have a procurement agreement, which generates a business opportunity to sieze revenue streams (Beltramello et al. 2013). The partership made it possible for the firm to make profits out of the meadow managent since a fair calculated price can be set. Hence, by establishing a partnership with a County Administrative Board, firms' might be able to facilitate and scale up the alternative use of meadow biomass and thus, the creation and delivery of value to customers (Bocken et al. 2014). Therefore, it might be reasonable to suggest that co-creation between stakeholders is making the value capture successful, as suggested by Prahalad & Ramaswamy (2004).

6.1.3. Value capture

The findings identified that Agri-environmental payments for mown meadows are important for value capture since it covers the costs for the meadow management.

Although, the payments are not enough to ensure long term maintenance of meadows as suggested by Wallander et al. (2019). Additionally, as argued by Teece (2010), value should be captured through product provisions, which is not the case when looking at the identified patterns from the empirical findings. The findings rather identified that the sold meadow hay merely generates a bonus-income, meaning that it contributes to extra revenue that is not enough to make meadow management profitable. Therefore, the requirement for increased profitability to ensure long term maintenance of meadows as suggested by (Naturvårdsverket 2020a), is not brought by revenue streams seized from the alternative use of meadow biomass.

The findings identified that the set prices of meadow hay vary amongst the firms. It might be reasonable to suggest that the firm's geographical locations, operational focus, areas of meadows and capacities to handle the meadow hay determine what price is set. The findings identified that it seems to be most profitable selling the meadow hay to rabbit owners. Therefore, the availability of rabbit owners as a customer segment might be a decisive factor. Since Stockholm is the capital of Sweden, it is likely that there are more rabbit owners in Stockholm County than in Kalmar County. Hence, it might be easier to find a customer base in Stockholm that is willing to pay fair price.

However, the findings identified that it is possible to attain enough revenue streams to ensure long term maintenance of meadows through a procurement agreement. Since a fair calculated price can be set for the meadow management within a procurement agreement, it is more likely that profit margins will be greater than costs in line with Richardson (2008). Meaning that co-creation between stakeholders can make value capture more successful, as suggested by Prahalad & Ramaswamy (2004). Although, meadow management is not only performed purely for economic reasons, environmental and social values are also included in the calculations of value capture (Bocken et al. 2014:49).

The empirical findings identified that the upholding of traditions is a captured value from the alternative use of meadow biomass. For example, by practicing the method of putting hay on frame, knowledge about the method is potentially passed on to future generations and thus, contribute to value for society. Furthermore, the findings identified that meadow management can provide social values by enriching communities, providing opportunities for people that are newly arrived to work in a calm environment and practice language, as well as green-rehabilitation.

The empirical findings identified that the meadow management generate natural- and cultural values, that are highly prioritised values in line with the Swedish environmental target system and EUs Habitats directive (Naturvårdsverket 2019; 2020). Since biodiversity linked to the agricultural landscape in Sweden is threatened (Naturvårdsverket 2020a), these natural and cultural values brought by the meadow management are positive contributions to environment and society. Moreover, even if customers might not be aware of it, the purchased meadow biomass can bring socio-economic gains. For example, the alternative use of meadow biomass can potentially release some arable land for cultivation of food for humans rather than fodder for livestock, as suggested by Gyldberg & Stenmark (2015).

Furthermore, the findings identified that the meadow biomass is viewed as a valuable resource, which indicate the importance of meadow biomass as a local supply of utility. Thus, it might be reasonable to suggest that the alternative use of meadow biomass can increase self-sufficiency, making local communities less vulnerable to eventual disturbances of external supply of utilities (Carlsson et al. 2014). This argument can be strengthened by the fact that the demand for the alternative use of meadow biomass increased in the county of Värmland in the drought-year of 2018 (Länstyrelsen Värmland 2018). The view of meadow biomass as a valuable resource, contradicts the fact that meadow biomass often is perceived as waste (Gyldberg & Stenmark 2015) and handled as a by-product of nature conservation (Sveriges Radio 2021). The alternative use of meadow biomass can contribute to reduction of environmental costs by transforming meadow biomass into value and thus, contribute to positive consequences for society.

6.2. Transaction costs in the market for meadow biomass

In line with the assumption that market transaction costs never can be eliminated, it is suggested that firms are impeded from using the market efficiently (Coase 1937). The findings from this study suggests patterns of possible transaction costs impeding firms' development in the market for meadow biomass and are illustrated Figure 6. Furthermore, the attributes of transaction costs can help to explain why these possible transaction costs in the market for meadow biomass occur.

6.2.1. Information cost

The findings identified that the search for information to find customers constitute a significant transaction cost, in line with Hobbs (1996). However, this transaction cost is on average classified as medium since efforts of finding customers can vary

amongst firms. On one side, the changes in supply and demand due to fluctuating volumes of harvested meadow hay from one year to another, contribute to incomplete information about products. Thus, firms might experience market uncertainty (Williamson 2008). On the other side, some firms might experience little to no information cost in relation to finding customers since it is not required to the same extent. Furthermore, the findings identified that search of information about pricing of meadow hay is a significant transaction cost, in line with Hobbs (1996). This transaction cost is classified as high on average due to the uncertainty about what prices customers expect. The malfunctioning communication between the trading parties can be the reason for uncertainty (Williamson 1979).

6.2.2. Negotiation cost

The findings identified that the transaction cost related to collection and purchasing of meadow hay can be contradictory. Making the physical agreement can be labour intensive for some firms and less labour intensive for other firms. If a firm have reoccurring customers, negotiations might not require a lot of labour since the transactions between the parties occur frequently. However, firms that do not have reoccurring customers are less likely to have frequent transactions and thus, it might be difficult to avoid higher negotiation costs (Riordan & Williamson 1985).

6.2.3. Monitoring cost

The findings identified that the activities concerning monitoring the agreement ex post the transaction can be time consuming when several smaller customers are purchasing meadow hay. For example, the bookings of several smaller transaction are perceived to be more time consuming than booking one large transaction. Furthermore, the findings identified that there are no guaranties that customer will pay for the meadow hay, especially when it concerns to new customers. This is a form of uncertainty (Williamson 1979) connected to opportunism thus, some customers might seek to achieve own beneficials by acting unfaithful towards a trading counterpart.

7. Conclusions

In this chapter the aim of the thesis is addressed. The aim includes to "Create an understanding of how firms might create value flows in the potential market for meadow biomass, through the lens of a sustainable business model archetype" and to "Explore possible transaction costs impeding firms' development in the market for meadow biomass". The chapter presents the main conclusions of the study.

The empirical insights display how incorporation of economic, environmental, and social aspects in the SBM can create value flows in the potential market for meadow biomass. These values might be created by firms through approaching horse- and rabbit owners that are interested in the nutritional contents, the absence of fertilizers and pesticides and the rich variety of herbs in meadow hay. The late mowing of meadows contributes to beneficial nutritional contents in the hay, which are suitable for horses. Personal contacts are important for the sale of meadow hay. However, digital channels can also be utilized for advertising. One suggestion could be that a digital platform for meadow hay might facilitate an efficient venue for sellers and buyers. Agri-environmental payments covers the costs of the meadow management but do not result in any substantial profits. The sold meadow hay generates a bonus-income but is not enough to make the meadow management profitable. However, with a procurement agreement meadow management might become profitable, since a fair and calculated price can be set. Although, since meadow management is not performed purely for economic reasons, environmental and social values are also included in the calculations of value capture. Including the upholding of traditions, communities being enriched and opportunities of employment. In addition, meadow management contributes to natural- and cultural values, while the meadow biomass is viewed as a valuable resource. Furthermore, the empirical insights display possible transaction costs. The most prominent transaction cost is information costs with regards to finding customers and evaluation of price. Other possible transaction costs are negotiation cost considering the collection and purchasing of products and monitoring costs considering having several but smaller customers and no guarantees for payments.

References

Alvesson, M. (2003). Beyond Neopositivists, Romantics, and Localists: A Reflexive Approach to Interviews in Organizational Research. *The Academy of Management Review*, 28 (1), 13–33. https://doi.org/10.2307/30040687 [2021-11-10]

Bell, E., Bryman, A. & Harley, B. (2019). *Business Research Methods*. Oxford University Press.

Beltramello, A., Haie-Fayle, L. & Pilat, D. (2013). Why New Business Models Matter for Green Growth. *OECD iLibrary*. https://doi.org/10.1787/5k97gk40v3ln-en [2021-09-18]

Bocken, N.M.P., Short, S.W., Rana, P. & Evans, S. (2014). A literature and practice review to develop sustainable business model archetypes. *Journal of Cleaner Production*, 65, 42–56. https://doi.org/10.1016/j.jclepro.2013.11.039 [2021-09-20]

Boons, F. & Lüdeke-Freund, F. (2013). Business models for sustainable innovation: state-of-the-art and steps towards a research agenda. *Journal of Cleaner Production*, 45, 9–19. https://doi.org/10.1016/j.jclepro.2012.07.007 [2021-09-20]

Bäckström, K. (2019). *Nu öppnar digital marknadsplats för köp och sälj av svensk ull!* https://www.land.se/landkoll/salj-och-kop-ull-pa-ullformedlingen/ [2021-09-15]

Carlsson, G., Svensson, S.-E. & Emanuelsson, U. (2014). *Alternativa skötselmetoder för ängs- och betesmarker och användning av skördat växtmaterial*. (2014:11). Alnarp: Fakulteten för landskapsarkitektur, trädgårds- och växtproduktionsvetenskap, Sveriges lantbruksuniversitet. https://pub.epsilon.slu.se/11094/

Chesbrough, H. (2010). Business Model Innovation: Opportunities and Barriers. *Long Range Planning*, 43 (2), 354–363. https://doi.org/10.1016/j.lrp.2009.07.010 [2021-09-22]

Coase, R.H. (1937). The Nature of the Firm. *Economica*, 4 (16), 386-405. https://doi.org/10.2307/2626876 [2021-09-08]

Corbin, J.M. & Strauss, A. (1990). Grounded theory research: Procedures, canons, and evaluative criteria. *Qualitative Sociology*, 13 (1), 3–21. https://doi.org/10.1007/BF00988593 [2021-10-28]

Creswell, J.W., Hanson, W.E., Clark Plano, V.L. & Morales, A. (2007). Qualitative Research Designs: Selection and Implementation. *The Counseling Psychologist*, 35 (2), 236–264. https://doi.org/10.1177/0011000006287390 [2021-10-26]

Dagens industri (2022). *Valutaomvandlare*. https://www.di.se/valutor/eursek-4606794/ [2022-01-13]

Diener, E. & Crandall, R. (1978). *Ethics in social and behavioral research*. U Chicago Press.

Distriktsveterinärerna (2021). *Varför får hästen fång?* https://distriktsveterinarerna.se/veterinaren-tipsar/veterinaren-tipsar--hast/fang--hast/varfor-far-hasten-fang--hast [2021-10-24]
Drakenberg, J. & Tikka, V. (2020). *Regional årlig uppföljning av miljömålen. Värmlandsl län 2020*. (2020:23). Värmland: Länsstyrelsen Värmland.
Eisenhardt, K.M. (1989). Building Theories from Case Study Research. *The Academy of Management Review*, 14 (4), 532-550. https://doi.org/10.2307/258557 [2021-11-01]
Given, L.M. (2008). *The SAGE Encyclopedia of Qualitative Research Methods*. SAGE Publications.
Guba, E.G. & Lincoln, Y.S. (1994). Competing paradigms in qualitative research. *Handbook of qualitative research*. Thousand Oaks, CA, US: Sage Publications, Inc, 105–117
Gyldberg, B. & Stenmark, M. (2015). *Hävd av Nedre Dalälvens älvängar- ekonomiska och ekologiska möjligheter*. Gysinge: Nedre Dalälvens Intresseförening. https://nedredalalven.se/filer/dokument/Slutrapport_115_Havd_av_alvangar.pdf
Hafiz, K. (2008). Case study ecmple. *The qualitative report*, 13 (4), 544-559. [2021-11-01].
Hall Diemer, M., Niemi Hjulfors, L., Lagerkvist Tolke, C. & Durling, M. (2013). *Kan nya metoder stärka skötseln av våra ängs- och betesmarker?* (2013:22). Jordbruksverket. https://webbutiken.jordbruksverket.se/sv/artiklar/ra1322.html
Hobbs, J.E. (1996). A transaction cost approach to supply chain management. *Supply Chain Management: An International Journal*, 1 (2), 15-27. https://doi.org/10.1108/13598549610155260 [2021-09-26].
Jordbruksverket (2021). *Miljöersättning för betesmarker och slåtterängar*. https://jordbruksverket.se/stod/lantbruk-skogsbruk-och-tradgard/jordbruksmark/betesmarker-och-slatterangar/betesmarker-och-slatterangar [2021-09-08]
Morell, M. (2001). Jordbruket i industrisamhället: 1870-1945, band 4 i Det svenska jordbrukets historia. https://www.ksla.se/bibliotek/fembandsverket/fembandsverket-band-4/
Lennartsson, T. & Axelsson Linkowski, W. (2011). Traditionell markanvändning och biologisk mångfald. I: *Naturvårdskedjan-för en effektiv naturvård*, Centrum för Biologisk Mångfald. 128-146. https://www.researchgate.net/publication/301613483_Traditionell_markanvandning_och_biologisk_mangfald
Lennartsson, T. & Westin, A. (2019). *Ängar och slåtter: historia, ekologi, natur- och kulturmiljövård*. Riksantikvarieämbetet. http://urn.kb.se/resolve?urn=urn:nbn:se:raa:diva-5938
Lincoln, Y.S. & Guba, E.G. (1986). But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation. *New Directions for Program Evaluation*, 1986 (30), 73-84. https://doi.org/10.1002/ev.1427
Länstyrelsen Värmland (2018). *Utsikt Värmland nummer 3 2018.* 2018:15. Länstyrelsen Värmland. https://www.lansstyrelsen.se/varmland/tjanster/publikationer/utsikt-varmland-nummer-3-2018.html [2021-10-11]
Länstyrelsen Värmland (2021). *Natur och kulturmiljöer i odlingslandskapet*. https://www.lansstyrelsen.se/varmland/natur-och-landsbygd/information-till-verksamma-pa-landsbygden/kompetensutveckling-och-radgivning/natur-och-kulturmiljoer-i-odlingslandskapet.html [2021-09-23]

Mackenzie, N. & Knipe, S. (2006). Research dilemmas: Paradigms, methods and methodology. *Issues in Educational Research*, 16 (2), 193-205 [2021-10-23]
Merriam, S.B. (1998). *Qualitative Research and Case Study Applications in Education.* San Francisco: Jossey-Bass Publishers.
Naturvårdsverket (2015). *Mål i sikte: analys och bedömning av de 16 miljökvalitetsmålen i fördjupad utvärdering*. (6662). Stockholm: Naturvårdsverket. http://naturvardsverket.diva-portal.org/smash/record.jsf?pid=diva2%3A919864&dswid=6495
Naturvårdsverket (2019). *Fördjupad utvärdering av miljömålen 2019*. https://www.naturvardsverket.se/Om-Naturvardsverket/Publikationer/ISBN/8800/978-91-620-8841-5/
Naturvårdsverket (2020). *EU:s direktiv för biologisk mångfald*. Naturvårdsverket. https://www.naturvardsverket.se/Miljoarbete-i-samhallet/EU-och-internationellt/EUs-miljooarbete/Biologisk-mangfald-i-EU/EUs-naturvardsdirektiv/
Naturvårdsverket (2020a). *Sveriges arter och naturtyper i EU:s art- och habitatdirektiv. Resultat från rapportering 2019 till EU av bevarandestatus 2013-2018*. Stockholm: Naturvårdsverket. https://www.naturvardsverket.se/Om-Naturvardsverket/Publikationer/ISBN/6900/978-91-620-6914-8/ [2021-09-14]
Odmark, I. (2019). Nu blir det lättare att sälja och köpa ull. *Jordbruksaktuellt*, 2021-09-30. https://www.ja.se/artikel/60910/nu-blir-det-lttare-att-slja-och-kpa-ull.html [2021-09-15]
Osterwalder, A. (2004). The business model ontology a proposition in a design science approach. https://doi.org/10.22005/bcu.15985
Osterwalder, A., Pigneur, Y. & Tucci, C.L. (2005). Clarifying Business Models: Origins, Present, and Future of the Concept. *Communications of the Association for Information Systems*, 16 (1), 1. https://doi.org/10.17705/1CAIS.01601
Porter, M.E. & Kramer, M.R. (2011). Creating Shared Value. I: Lenssen, G.G. & Smith, N.C. (red.) *Managing Sustainable Business: An Executive Education Case and Textbook*. Dordrecht: Springer Netherlands, 323-346. https://doi.org/10.1007/978-94-024-1144-7_16
Prahalad, C.K. & Ramaswamy, V. (2004). Co-creation experiences: The next practice in value creation. *Journal of Interactive Marketing*, 18 (3), 5-14. https://doi.org/10.1002/dir.20015
Päiviö, E.-L. (2008). *Det agrara landskapet på vinst eller förlust*. Diss. Sveriges Lantbruksuniversitet. https://pub.epsilon.slu.se/1899/ [2021-09-08]
Richardson, J. (2008). The business model: an integrative framework for strategy execution. *Strategic Change*, 17 (5-6), 133-144. https://doi.org/10.1002/jsc.821
Rindfleisch, A. & Heide, J.B. (1997). *Transaction Cost Analysis: Past, Present, and Future Applications. Journal of marketing*, 61 (4), 30-54. https://journals.sagepub.com/doi/abs/10.1177/002224299706100403 [2021-11-24]
Riordan, M.H. & Williamson, O.E. (1985). Asset specificity and economic organization. *International Journal of Industrial Organization*, 3 (4), 365-378. https://doi.org/10.1016/0167-7187(85)90030-X
Sassner, H. & Granswed, I. (2019). *De fem domänerna*. https://hastsverige.se/om-hastar/hastens-valfard-2/de-fem-domanerna/ [2021-11-29]
Shenton, A. (2004). Strategies for Ensuring Trustworthiness in Qualitative Research Projects. *Education for Information*, 22, 63-75. https://doi.org/10.3233/EFI-2004-22201

Simon, H.A. (1957). *Models of man; social and rational*. xiv, 287. Oxford, England: Wiley.
Statistics Sweden (2021). *Kartor över regionala indelningar.* http://www.scb.se/hitta-statistik/regional-statistik-och-kartor/regionala-indelningar/kartor-over-indelningar/ [2021-11-29]
Ström, R. (2006). *Ängar och betesmarker i Västmanlands län: inventering 2002-2004*. (2006:21). Länsstyrelsen i Västmanlands län. http://urn.kb.se/resolve?urn=urn:nbn:se:naturvardsverket:diva-3769 [2021-09-15]
Svensson, A., Bengtson, J., Andersson, L., Widmark, L., Lassbo, M., Bengtsson, R. & Nordström, T. (1995). *Hävd av strandängar*. (198). Uppsala. https://pub.epsilon.slu.se/3843/ [2021-10-21]
Svensson, J. & Moreau, A. (2012). *Ängar*. [Broschyr]. Jordbruksverket. https://webbutiken.jordbruksverket.se/sv/artiklar/angar.html [2021-10-14]
Sveriges Radio (2021). Morgon i P4 Stockholm. Mia, Fredrik, Sanna, Ola, 2021-10-21. 2:17:30-2:21:20. https://sverigesradio.se/avsnitt/1804190 [2021-10-21]
Teddlie, C. & Yu, F. (2007). Mixed Methods Sampling: A Typology With Examples. *Journal of Mixed Methods Research*, 1 (1), 77-100. https://doi.org/10.1177/1558689806292430. [2021-11-02]
Teece, D.J. (2010). Business Models, Business Strategy and Innovation. *Long Range Planning*, 43 (2), 172-194. https://doi.org/10.1016/j.lrp.2009.07.003. [2021-10-10]
Temple, B. & Edwards, R. (2002). Interpreters/Translators and Cross-Language Research: Reflexivity and Border Crossings. *International journal of qualitative methods*, 1 (2), 1-12. https://journals.sagepub.com/doi/full/10.1177/160940690200100201 [2022-01-14]
Ullförmedlingen (2018). Lättare att köpa och sälja svensk ull. Ullförmedlingen. https://ullformedlingen.se/press
Ullförmedlingen (2021). *Ullförmedlingen*. https://ullformedlingen.se [2021-11-29]
Världsnaturfonden (2014). *Naturbetesmarker*. Youtube, 2014-11-20. https://www.youtube.com/watch?v=IIh5g5YSiYQ [2021-10-21]
Wallander, J., Karlsson, L., Berglund, H., Mebus, F., Nilsson, L., Bruun, M. & Johansson, L. (2019). *Plan för odlingslandskapets biologiska mångfald*. (2019:1) Jordbruksverket. https://webbutiken.jordbruksverket.se/sv/artiklar/ra191.html [2021-09-15]
Westin, A., Iuga, A. & Lennartsson, T. (2013). Managing biodiversity rich hay meadows in the EU: A comparison of Swedish and Romanian grasslands. *Environmental Conservation*, 40 (2), 194-205. https://doi.org/10.1017/S0376892912000458 [2021-09-08]
Williamson, O.E. (1979). Transaction-Cost Economics: The Governance of Contractual Relations. *The Journal of Law and Economics*, 22 (2), 233-261. https://www.journals.uchicago.edu/doi/abs/10.1086/466942 [2021-11-23]
Williamson, O.E. (2008). Transaction Cost Economics. I: Ménard, C. & Shirley, M.M. (red.) *Handbook of New Institutional Economics*. Berlin, Heidelberg: Springer, 41-65. https://doi.org/10.1007/978-3-540-69305-5_4
Yin, R.K. (2009). *Case Study Research: Design and Methods*. SAGE.
Zhang, Y. & Wildemuth, B. (2009). Unstructured interviews. Applications of social research methods to question in information and library science, 22-231.

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Appendix 1

Table 3. Generated values. Caroline, Mittlandsgården, Kalmar County.

	CAROLINE
VALUE PROPOSITION	
CUSTOMER SEGMENTS	Horse owners, rabbit owners and horticulturists
PRODUCT	Customers interested in the content of the meadow hay
	No fertilizers nor pesticides applied
	Favours biodiversity
	Favours cultural heritage and traditions
	Rich variety of herbs
	Valuable resource
	Potential: Analysing the content of meadow hay
RELATIONSHIPS	Regular customers
	Good relations
VALUE CREATION	
KEY ACTIVITIES	Meadow raking (Mars- April)
	Mowing (July- October)
	Round bales
RESOURCES	Labour: Four to five persons
	Extra employees during shorter periods
	Rake, two-wheeled tractors with beams, brush saws, swath turner, square baler, and wagon
CHANNELS	Facebook Marketplace
	Own Facebook page
	Personal contacts
	Potential: Own website might be used in the future
PARTNERS	Procurement agreement with the County Administrative Board of Kalmar
VALUE CAPTURE	
COST STRUCTURE & REVENUE STREAMS	Profitable (with the procurement agreement Caroline can set a fair calculated price)
	The sold meadow hay generates a bonus-income
	Charge SEK 5 per kilo for the meadow hay

CONTRIBUTION TO ENVIRONMENT & SOCIETY	Rabbits owners charged SEK 100 per bale Horse owners charged SEK 40 per bale (delivery directly at the meadow) Horticulturists charged SEK 10-20 per bale Natural- and cultural values Tradition Recreation Employer for persons that are newly arrived

Table 4. Transaction costs. Caroline, Mittlandsgården, Kalmar County.

CHARACTERISTICS	LEVEL	CAROLINE
INFORMATION COSTS	High	Time spent on finding customers Evaluation of price
NEGOTIATION COSTS	Low	Collection and purchasing
MONITORING COSTS	Medium	Several smaller customers

Table 5. Generated values. Emma, Borgholm, Kalmar County.

	EMMA
VALUE PROPOSITION	
CUSTOMER SEGMENTS	Horse owners, sheep owners. Potentially rabbit owners
PRODUCT	Customers interested in the content of the meadow hay Offer customers a content analysis of the meadow hay Rich variety of herbs No fertilizers nor pesticides applied
RELATIONSHIPS	Not yet an established customer base
VALUE CREATION	
KEY ACTIVITIES	Mowing (July- October) Round bales- and square bales
RESOURCES	Labour: Two to three persons Hire a neighbour to performed pressing of round bales Tractor with a beam, tedder, swath turner, square- and round baler, wagon
CHANNELS	Blocket Personal contacts
PARTNERS	N/A

VALUE CAPTURE	
COST STRUCTURE & REVENUE STREAMS	Profitable (the Agri-environmental payments covers the costs of the meadow management) The sold meadow hay generates a bonus-income Charge SEK 2,5 per kilo for the meadow hay
CONTRIBUTION TO ENVIRONMENT & SOCIETY	Natural- and cultural values Valuable resource Green rehabilitation

Table 6. Transaction costs. Emma, Borgholm, Kalmar County.

CHARACTERISTICS	LEVEL	EMMA
INFORMATION COSTS	High	Time spent on finding customers Evaluation of price
NEGOTIATION COSTS	High	Collection and purchasing
MONITORING COSTS	Medium	Several smaller customers No guarantees customers will pay

Table 7. Generated values. Per, Hjälmö, Stockholm County.

	PER
VALUE PROPOSITION	
CUSTOMER SEGMENTS	Neighbouring farms with beef cattle
PRODUCT	Rich variety of herbs No fertilizers nor pesticides applied Positive and indirect effect on added value of mutton- and sheepskin products
RELATIONSHIPS	Sells meadow hay occasionally to neighbouring farms
VALUE CREATION	
KEY ACTIVITIES	Mowing (end of July) Round bales Transport bales by ferry
RESOURCES	Labour: Two persons Tractor with a beam, tedder, swath turner, square- and round baler, wagon
CHANNELS	Personal contacts
PARTNERS	N/A
VALUE CAPTURE	

COST STRUCTURE & REVENUE STREAMS	No profit nor loss (the Agri-environmental payments covers the costs of the meadow management) The sold meadow hay generates al bonus-income Charge SEK 1 per kilo for the meadow hay
CONTRIBUTION TO ENVIRONMENT & SOCIETY	Natural- and cultural values Valuable resource

Table 8. Transaction costs. Per, Hjälmö, Stockholm County.

CHARACTERISTICS	LEVEL	PER
INFORMATION COSTS	Low	Time spent on finding customers
NEGOTIATION COSTS	Medium	Collection and purchase
MONITORING COSTS	N/A	N/A

Table 9. Generated values. Karen, Ingarö, Stockholm County.

	KAREN
VALUE PROPOSITION	
CUSTOMER SEGMENTS	Horse owners, rabbit- and guinea pig owners
PRODUCT	Customers interested in the content of the meadow hay No fertilizers nor pesticides applied Less dust in the meadow hay Rich variety of herbs Handling the hay manually
RELATIONSHIPS	Regular customers Good relations
VALUE CREATION	
KEY ACTIVITIES	Mowing (end of July) Putting on frame Square bales
RESOURCES	Labour: five to ten persons Knowledge about putting on frame Attain help from family and neighbours Tractor with a beam, tedder, swath turner, square baler, wagon
CHANNELS	Personal contacts
PARTNERS	N/A
VALUE CAPTURE	
COST STRUCTURE & REVENUE STREAMS	No profit nor loss (the Agri-environmental payments covers the costs of the meadow management)

CONTRIBUTION TO ENVIRONMENT & SOCIETY	The sold meadow hay generates a bonus-income Charge SEK 6,5 per kilo to horse owners Charge SEK 35 per kilo to rabbit- and guinea owners Natural- and cultural values Valuable resource Tradition Community of family and neighbours

Table 10. Transaction costs. Karen, Ingarö, Stockholm County.

CHARACTERISTICS	LEVEL	KAREN
INFORMATION COSTS	Low	Time spent on finding customers
NEGOTIATION COSTS	Low	Collection and purchasing
MONITORING COSTS	High	Several smaller customers

Appendix 2

Interview guide

1. Where in the country is your firms located?
2. What is your operational focus?
3. How many hectares permanent grasslands (meadows/pastures/fossil fields) do you mow continuously?
4. Do you receive any Agri-environmental payments for the mown meadows?
5. How many hectares mown meadows do you harvest?
6. What is the harvested meadow biomass used for?

Part 1 – The business model

7. What is your *value proposition** in the firm regarding the meadow biomass?
   a) *A value proposition means the type of value flows delivered to customers, what the customers are willing to pay for the product, and what competitive advantages the firm receives through the sale of the product. Think in terms of products, customer segments and relationships.
   b) Do you perceive that the concept waste is eliminated when meadow biomass is transformed into a useful and valuable input for other production?
8. How do you *create value* through the meadow biomass?
   a. Describe the main activities (tasks), resources (labour, time, energy, knowledge), channels (personal contacts, digital ads), partners (collaborations) conserving the meadow management.
   b. Which activities and partners are important to you to utilize underutilized capacity? Have you started new collaborations to capture and transfer waste streams of meadow biomass?
9. How do you *capture value*?
   a. What is your cost structure and source of income regarding the meadow biomass?
   b. Are your economic and environmental costs reduced when the meadow biomass is transformed into value flows? Are there any positive contributions to society and the environment through the alternative use of meadow biomass?

Part 2 – Transaction costs

10. What transaction costs is or has been an obstacle for you to establish or develop in the market? Think in terms of:
    a. Searching for information on products and prices, finding buyers or sellers.

b. Enter the physical agreement by writing a contract or negotiating a contract.
c. Ensuring that the agreement is fulfilled by all parties after the transaction has been completed.

11. What part of the business model is characterized by which obstacles (transaction costs)?
    a. Value proposition: What transaction costs arise concerning products, customer segments and relationships?
    b. Value creation: What transaction costs arise concerning activities, resources, channels, and partners?
    c. Value capture: What transaction costs arise concerning cost structure and source of income?