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Department of Economics

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Summary

The world's population is increasing, thus the need for food as well. As a result, innovation is needed in the agriculture sector to increase the production of food. Genetically modified, GM, crops could be such an innovation. However, with the use of GM crops today, some disadvantages have led to that the European Union have banned GM crops in cultivation within the union. Nevertheless, the EU imports a significant amount of GM crops from other parts of the world, such as Brazil, to use in animal feed, especially GM soybeans due to the high protein content. Sweden is the one country within the union that only imports GM-free soybeans due to a joint agreement among commercial actors.

While GM crops are globally grown on approximately 170 million hectares in the world, the debate concerning its appropriateness as food source is common in the EU. Even if a lot of research has been done in the field of GM crops, a consensus has not yet been reached if a GM crops should be accepted to be cultivated within the EU. Research has been done on both consumers' and policy makers' attitudes regarding GM crops. However, little attention has been made on the commercial actor' perspective. This study aims to, by using an ethical framework, investigate the commercial actors' perspective regarding the use of GM soybeans in animal feed in Sweden.

The empirics of this study focus on an existing multi-stakeholder network, The Swedish Soy Dialogue, where commercial actors have promoted a more sustainable soy production but have not discussed GM soybeans. Through a purposive sampling strategy, four key informants were selected to provide the study with empirical data. The study has a qualitative approach, and the data were collected using semi-structured interviews.

In this study, the use of GM soybeans in animal feed has been seen as a wicked problem. A nuanced picture of the different key informants is presented in the light of the analytical framework that is developed from this study's theoretical framework. The key informants have different reasoning and motive behind their standpoint, all of them equally meaningful and important when trying to get an understanding of the different perspective.

Sammanfattning

Jordens befolkning ökar och därmed ökar också behovet av livsmedel. Det finns ett stort behov av innovationer inom den agrara näringen för att höja produktiviteten samtidigt som produktionen behöver bli mer hållbar. En av de innovationer som skulle kunna vara ett verktyg för att höja produktiviteten och bidra till ett mer hållbart jordbruk är genmodifierade grödor. Dock så finns det nackdelar med genmodifierade grödor så som de används idag vilket har lett till ett förbud att odla dessa inom EU. EU importerar fortfarande stora mängder för att använda som proteinkälla i animaliefoder. Detta gäller framför allt sojabönor. Sverige är ett undantag inom unionen då Sverige som enda land väljer att endast importera sojabönor som inte är genmodifierade, även till animaliefoder. Detta kommer sig utav att aktörerna på marknaden själva, utan pådrivningar från myndigheter, har beslutat sig för att endast använda sojabönor som inte är genmodifierade.

Samtidigt som genmodifierade grödor odlas på över 170 miljoner hektar i världen, debatteras deras existens i Europa. Mycket forskning har bedrivits på området utan att komma fram till huruvida genmodifierade grödor bör förbjudas eller inte. Forskningen har också undersökt både konsumenters och beslutsfattares attityder till genmodifierade grödor och kan påvisa olika faktorer som påverkar framför allt konsumenters attityd gentemot genmodifierade grödor. Däremot finns det lite forskning på hur kommersiella aktörer ställer sig till användandet av genmodifierade grödor. I denna studie används ett etiskt ramverk för att undersöka kommersiella aktörers perspektiv till användandet av genmodifierade sojabönor i animaliefoder i Sverige.

Studien utgår ifrån ett existerande multi-stakeholder network, Svenska Sojadialogen, där kommersiella aktörer har diskuterat hållbarhetsfrågan inom sojaproduktionen tidigare, men inte frågan om genmodifierade soja. Genom ett selektivt urval väljs fyra nyckelinformatörer ut som bidrar med studiens empiriska material. Studien har en kvalitativ ansats och det empiriska materialet samlades in genom semistrukturerade intervjuer.

I studien hanteras användningen av genmodifierad soja i animaliefoder som ett wicked problem. En nyanserad bild över de olika nyckelinformatörernas perspektiv presenteras utifrån de analytiska teman som härleds ifrån det teoretiska ramverket. De olika aktörerna har olika resonemang och motiv till deras ställningstagande, vilka alla är lika betydelsefulla och viktiga för att skapa en förståelse för de olika perspektiven.

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1 Introduction

The world's population is growing rapidly and the Food and Agriculture Organisation of the United Nations (FAO) estimates that the world's population will reach 9.1 billion by the year 2050 (FAO, 2009). To feed that many people food production must increase by 70 percent (FAO, 2009). There are especially two factors which increase the demand for food, one is the population's growth and the other is the change in food habits (Kearney, 2010). When the middle class in developing countries becomes larger the demand for meat and animal products increase since a western-world diet is adopted (Van Eenennaam, 2013; Kearney, 2010). In order to meet the demand of food in the year 2050, the agriculture sector needs a new green revolution. The green revolution describes the high increase in global food production due to technologically progress that occurred in the late 1950s which allowed for an increase in wheat and rice production with 88 respectively 74 percent between year 1960 and 1979 (Evenson & Gollin, 2003). Today the challenge is even more complex than it was nearly eighty years ago when it "only" was concerned with food supply. The challenge of today is not only to produce more food but also to do so in a more sustainable way. Innovation is thus needed to address these challenges.

Innovation is defined as the process of bringing something new into the world, through a combination of intellectual and practical ingenuity (Stilgoe *et al.*, 2013). Therefore, an innovation can be everything from using an established artefact in a new way or to develop something that is new to the world. Porter (1990) argue that a central part of innovation is how innovations are used and fulfils a purpose in a society, which Porter calls commercialisation. Commercialisation and innovations are therefore the keystones to progress in a society (Porter, 1990). Innovation is the process and innovations are the outcomes of this process. For example, innovations such as the Internet or the combustion engine has made a vast contribution to our society. Innovations increase welfare in the society and are the core of economic growth (Ahlstrom, 2010; Mortensen & Bloch, 2005). In order to encounter the challenges named in the previous paragraph, innovations within the agricultural sector are especially crucial. According to Chhotray and Stoker (2009), in the past the government was practically the only actor who, through different institutions, contributed to innovation and shaped the development and progress in the society. However, this has changed during the last decades where other actors, commercial actors in particular, have started to become more and more important actors shaping innovations. In the food industry, there are commercial actors who have a profit interest in developing genetically modified (GM) crops. For example, pesticide corporations that develop pesticide resistant crops would benefit from an increase use of their products (Benbrook, 2012). GM crops are plants whose genetic material has been artificially modified to change their characteristics in some way (Prakash *et al.*, 2011).

Despite the importance of innovation in the society and in agriculture, there has long been a certain resistance against technological revolutions. One example is the Luddites in Great Britain that opposed to industrial revolution in the start of 1810s. Masked men in groups started to destroy machinery belonging mainly to the textile industry but also Hargreaves' spinning Jenny was destroyed on several occasions (Stilgoe *et al.*, 2013; Nuvolari, 2002). Today, over two hundred years later, the same patterns can be observed when anti-GM protesters rip up fields of GM crop in Great Britain (Stilgoe *et al.*, 2013; Augoustinos *et al.*, 2010). This is one example of the fact that the social acceptance for GM crop is low. This happens at the same time as the World Health Organisation (WHO) states that there are little

practical risks with genetically modified organisms, GMO, even if it exists some theoretical ones (www, WHO, 2014). However, the WHO means that there is a low estimated probability for such theoretical risks. These theoretical risks are allergenicity, gene transfer and outcrossing. Allergenicity would mean that genes from allergenic organism would transfer to non-allergic organisms' causing allergy reactions that would not happen with the natural organism. Gene transfer refers to the risk that GM crops would increase the spread of antibiotic resistance genes. Outcrossing is the risk of genes transferring from GM crops to wild or natural plant, which would be a risk for the biodiversity (www, WHO, 2014). WHO has the standing that the precautionary principle should be applied to GM food since there are uncertainties with respect to GM food. The precautionary principle means that when there are uncertainty and lack of scientific consensus about a new technique the use of the technique should be avoided (Sunstein, 2003; Levidow *et al.*, 2000). However, some researchers argues that GM crops is one innovation that could contribute to tackling challenges such as global food security and climate change (Bawa & Anilakumar, 2013; Fagerström *et al.*, 2012).

1.1 Problem Background

Despite WHOs concerns and their precautionary principle, GM crops were globally grown by 17.3 million farmers on over 170 million hectares in the year 2012 (Clive, 2012; James, 2010). Estimations show that between 70 – 90 percent of the biomass from GM crops harvested globally is used in animal feed which makes livestock the major consumers of GM crops (Clive, 2012). The most common GM crops are cotton, corn, canola and soybeans. Globally 81 percent of soybeans, 81 percent of cotton, 35 percent of corn and 30 percent of canola produced are genetically modified. US, Brazil, Argentina, India, Canada and China produces approximately 95 percent of all the biomass deriving from GM crops (Clive, 2012). In other words, the cultivation of GM crops is concentrated to a few countries.

The European Union (EU) has adopted the same standpoint as WHO, the precautionary principle, regarding GM food (Wohlers, 2013). This statement was made during the 1990s when the technology still was rather young and the consequences were unknown. Since then the EU has adopted a new legislation where the EU can allow GM crop to be cultivated within the union but every member state can decide to forbid the crop within their own state. This unlike other laws within the union where, if the commission individually approves a product, the member states cannot oppose this (www, SVD, 2017). EUs legislation only applies to food for human consumption which results in that GM crops indirectly exists in the EU through animal feed (Inghelbrecht *et al.*, 2014; Van Eenennaam, 2013). During the year 2015 the EU imported 5.8 million tons soybeans and 8.4 million tons of soybean meal (www, Oil World, 2017).

Studies show that consumers are unaware of the fact that most livestock in EU consume feed that is based on GM crops (Inghelbrecht *et al.*, 2014; Clive, 2012). The European Commission conducts and publishes surveys regularly, in which they investigate the general opinions in different questions among the public opinion in the union. The survey is called Eurobarometer and has, since the early 1990s, included attitudes towards biotechnology (Eurobarometer, 2010). The Eurobarometer shows that, in general, consumers in the southern part of Europe have a more negative attitude to GM food than consumers have in the northern part (Eurobarometer, 2010). Studies of Swedish consumers shows that they, in general, are more sceptical to GM than the average European consumer (Magnusson & Hursti, 2002; Frewer & Shepherd, 1995). Although these survey studies can by criticized for only focusing on attitudes and not taking a close look at the problem by looking at consumers' perspectives

of why they do not want GM crops. For example, some studies have shown that nearly an equal number of consumers who do not want GM crops do not want DNA in their food (McFadden & Lusk, 2016) which implies that the consumers have not understood the concept of GM crop (Ceccoli & Hixon, 2012). When controversies of new technology arises, Frewer and Shepherd (1995) argues that an ethical approach is crucial in order to reach a social acceptance. As of today, it is not possible to distinguish between a food product that has been produced with GM crops and a product that has been produced with GM free crops (Inghelbrecht *et al.*, 2014).

1.2 Problem

In a market where consumers cannot separate what they see as a high-quality (non-GM) product and a low-quality (GM) product can result in decreasing demand for the high-quality product. This will result in a market only for the low-quality product (Akerlof, 1970). A study made on Swedish consumers confirmed that consumers were willing to pay more for meat coming from animals that had not been fed fodder containing GM crops (Carlsson *et al.*, 2007). When GM crops are not socially accepted by a majority in the society and therefor are not available on the market, consumers with lower ability to pay for the high-quality products will be forced to pay the premium and thereby a loss of welfare may occur (Lapan & Moschini, 2004). An increase of the premium can create a social problem were consumers with high-income demands non-GM crops and consumers with lower ability to pay cannot afford the premium product. Since compound feed companies cannot separate GM crops from non-GM crops the consumers who can mobilise the largest social support will force the other consumers to accept a market that is not favourable from their perspective i.e. according to Lapan and Moschini (2004) a welfare loss has occurred.

Soybeans are an important source of protein for livestock within the EU (Henseler *et al.*, 2013). Until 2014, actors in the animal feed value chain within the Swedish agriculture sector agreed to exclude GM crops in animal feed (www, Sveriges Radio, 2014). These actors is different intermediaries such as the dairy cooperative Arla, the largest slaughter company HK Scan and the largest supplier of animal feed Lantmännen. This agreement was built on voluntariness from the firms and was not a result of a legislation (Jordbruksverket, 2009). Since GM food is highly debated among stakeholders (e.g. consumers, policymakers, authorities and researchers), the agreement was to exclude GM crops in animal feed, including soybeans. The agreement was abandoned in the year 2014 due to European competition legislation making it unclear whether the agreement broke any laws. This means that there are no law or mutual agreement that keeps actors from using GM soybeans in animal feed. Since it is up to every company to independently decide if they want GM soybeans or not, this puts pressure on the feed compound manufacturers to distinguish the different crops from each other. However, since the feed companies cannot manage both GM and non-GM soybeans in their factories, it only exists non-GM soybeans in Swedish animal feed. This lead to that Swedish livestock eats feed that only contains non-GM soybeans. The non-GM soybeans imported to Sweden origins mainly from Brazil (Heimer, 2010). Due to increasing demand of non-GM soybeans from other parts of Europe and decreasing supply from Brazil, Swedish feed companies sees a risk where they no longer can ensure a sufficient supply of non-GM soybeans to the Swedish market.

Many studies have investigated consumers' attitudes towards GM crops (Ceccoli & Hixon, 2012; Costa-Font *et al.*, 2008; Carlsson *et al.*, 2007; Frewer, 2003; Magnusson & Hursti, 2002). The research shows that the consumers for various reasons have a negative attitude to

food that contains GM crops. Many consumers have moral doubts about eating food that includes GM crops in the production of the food (Frewer *et al.*, 2013; Frewer, 2003; Magnusson & Hursti, 2002). However, this moral doubt does not concern the consumers when regarding other products due to that it is shown that they have a positive attitude towards the use of GMO for medical purposes, even if the technology is more or less the same (Gaskell *et al.*, 2000; Bauer *et al.*, 1998; Frewer & Shepherd, 1995). Many consumers have a negative attitude towards GM crops and Frewer *et al.* (1996) states that it is the social distrust that is one of the most important factors that affect the attitudes towards GM products. It is therefore valuable to use an ethical approach to investigate GM crops. According to public opinion surveys, Swedish consumers do not want GM soybeans in their food and they are willing to pay a premium for this (Carlsson *et al.*, 2007; Magnusson & Hursti, 2002). On the other hand, the Swedish feed industry point out that it becomes increasingly difficult to get hold of non-GM soybeans and that the premium for non-GM soybeans increases (pers. com., Walle, 2017). Further, the Swedish food industry states that they do not want products containing GM soybean in their assortment as long as a majority of consumers do not want to buy these products (www, Konsumentföreningen Stockholm, 2012). Progress and development in society are no longer controlled by one key actor but to several, including commercial actors.

While consumers' attitude is well investigated, few studies have looked upon other actors in the value chain of GM crops, notably commercial firms. Inghelbrecht *et al.* (2014) states that GM-free soybeans in animal feed can be viewed as a wicked problem since it involves conflicts, disagreements and high level of complexity. Some studies have focused on how different industries handle the wicked problem that consumers say they do not want GM crops but GM crops still exist without consumers knowledge (Inghelbrecht *et al.*, 2014; Van Eenennaam, 2013). A wicked problem is characterised by that it has no scientific solution but must be solved by a mutual agreement in a process among stakeholders (Jentoft & Chuenpagdee, 2009). However, even if some studies identify GM soybeans in animal feed as a wicked problem, the studies do not explore neither explain how the industry view the problem. Thus, there is a gap in the literature of how actors within the food industries view the issue of GM soybeans in animal feed. The focus of this study is the ethical perspective of the wicked problem regarding GM soybeans in animal feed in the Swedish market. This study will contribute to a better understanding for the wicked problem regarding GM soybeans in animal feed by taking the commercial actors' perspective into account.

The market for GM soybeans is global and even if it is not allowed to cultivate GM soybeans within the EU, it is allowed to import GM soybeans to use as animal feed. While almost all the countries within the EU import soybeans to use as animal feed, Swedish food industry has a joint position not to use GM soybeans in animal feed. Since academic literature has focused on consumers' attitudes or focused on the impact on GMO on a producer level there is a knowledge gap in research were the industries perspective and ethical standpoint is unknown. This makes it interesting to investigate the commercial actors' perspective of GM soybeans in animal feed from an ethical point of view. This study focuses on the ethical concerns of commercial actors and therefore, this study will use an ethical framework based on Boatright (2009); García-Rosell and Moisander (2007); DesJardins (1997) to study the commercial actors' perspective of the issue of GM soybeans in animal feed in Sweden.

1.3 Aim and Research Questions

The aim of this study is to investigate commercial actors' ethical perspective of the use of GM soybeans in the Swedish animal feed market.

- What is the key informants' view on using GM soybeans in feed in the Swedish animal feed market?
- What are the key informants' motives, actions and consequences of their standpoint?

1.4 Delimitations

This study has several delimitations. GM crops are not allowed to be cultivated in Sweden. However, GM crops do indirectly exist through imported meat. When the Swedish GM soybean market is discussed in this paper, it refers to animal feed. When using terms like "containing GM soybeans" and referring to animal products, the reader should be aware that animal products, e.g. meat and dairy, do not contain any traces of GM in the products DNA. However, since the end product for human consumption, if containing traces of GMOs, must be labelled, this study focuses on GM products that are hidden in the system e.g. through animal feed where no labelling is required.

GM crop is controversial and heavily debated. It exists critique against GM crops mainly concerning environmental and ethical questions. This paper will only consider GM soybeans on the Swedish market. It is often mainly soybeans that are being discussed as a problem in the feed industry. This is linked to that soybeans and cotton is more usual as GM variations than non-GM and cotton is not used in animal feed in Sweden.

Stakeholders are in this paper defined as actors, which has an interest in or are affected by the existence or non-existence of GM soybeans in animal feed on the Swedish market. Commercial actors on the other hand, are defined as those stakeholders who handle the physical product or a refined product, or are a lobby organisation within the food industry.

1.5 Outline

This thesis has a structure as followed: The first chapter includes an introduction to the subject, describes the existing problem and the aim of the study. The research questions formulated provides the reader with a guideline for the analysis and literature review. Then follows chapter two, which provides the study's theoretical framework and a literature review. Chapter three provides the reader with an explanation for which method that has been used. It includes research design, arguments for the chosen method, ethical considerations and a credibility argument. In chapter four, a background for the empirical study is presented for a better understanding of the case. The results of the study are presented in the following chapter. The results are analysed and discussed in the following chapter with assistance of the theoretical framework developed in chapter two. The paper concludes by addressing the research questions in the final chapter and suggests topics for future research.

2 Literature Review and Theoretical Perspective

This chapter provides a review of literature on the phenomena of GM crops. The literature review introduces GM crops to give the reader an understanding of this phenomenon. Theories deployed to explore ethical concerns of commercial actors are presented subsequently. First, the theory of a wicked problem is presented to give the reader an understanding of complex problems. Wicked problems are most commonly treated throughout collaborations between stakeholders. Therefore, the second theory presented is stakeholder theory. Finally, an ethical framework is developed from literature and used for analysing different perspective among commercial actors.

2.1 Literature Review

The literature review introduces GM soybeans, which is the phenomena explored in this study. The literature shows that researchers cannot reach an agreement whether GM crops are safe, neither from a human health or environmental perspective. Although much written about GM crops, the literature has not covered all the actors in the value chain, which will be discussed in further paragraphs.

2.1.1 The Story of GM Crops

Breeding plants began around year 7000 B.C. when people started to sow seeds from last year's harvest instead of collecting seeds from wild plants (Barrows *et al.*, 2014; Lehrman *et al.*, 2014). Plants that generated the highest yields were selected and used as seeds for the following year. This early form of plant breeding and natural selection has been developed through the years but it was when Gregor Mendel, in the second part of the 18th century, discover the *laws of inheritance* and the possibilities of breeding was revealed (Orel & Finn, 1996; Mendel *et al.*, 1993). Gregor Mendel discovered how genes could determine different attribute depending on if the genes were dominant or recessive. Thus he opened up for new possibilities for plant breeding (Bateson & Mendel, 2013; Orel & Finn, 1996). About 50 years after Mendel's discovery, another great discovery emerged. By being able to describe the DNA molecule, its structure and that genetic material is carried by DNA lead to that the real potential of plant breeding was recognised (Lehrman *et al.*, 2014). GM is a change in the DNA in an organism with the aim to give the organism new or different abilities (Alderborn *et al.*, 2010; Jones, 1999).

Within the agricultural sector, GM crops have mostly been used to give the crops abilities that give them advantages compared with conventional crops. These advantages can be higher resistance against fungicides or insects, higher tolerance for herbicides or the ability to grow during, otherwise, bothersome conditions (Lehrman *et al.*, 2014; Alderborn *et al.*, 2010). GM crops are grown mainly in North America, South America and in Asia and the most common GM crops are soybeans, cotton, corn and canola (Clive, 2012). The debate about GM crops has divided researchers into two groups where one side argues for the use of GM crops and the other side argues against the use of GM crops.

Those who oppose the use of GM crops have concerns about the negative effects on human health and on the environment (Barrows *et al.*, 2014; Prakash *et al.*, 2011). These risks are often divided into the three categories: allergenicity, gene transfer and outcrossing (Chow *et*

al., 2016; Finkelstein, 2016). Even if there have not been any cases of allergenicity until today, the risk cannot be theoretically excluded (Chow *et al.*, 2016; Yavari *et al.*, 2016). The same matter is applied to gene transfer which is the risk that the technology behind GM crops would increase the spread of antimicrobial resistance (Craig *et al.*, 2008; European Food Safety, 2007). Outcrossing is the risk of GM crops pollination with wild plant and spreading the genes that were put into the GM crop (Chandler & Stevenson, 2014; Stewart *et al.*, 2003). This could, in a longer term, perspective threaten biodiversity (Jacobsen *et al.*, 2013; Carpenter, 2011).

Those who argues for the use of GM crops focus on the potential and the advantages that GM crops offer. The potential is often described as higher yields, less use of agrochemicals, lowering production cost for farmers and giving consumers access to cheaper food (Barrows *et al.*, 2014; Klümper & Qaim, 2014). Some research also argue for GM crops as something necessary to handle the climate change and to feed the growing population (Barrows *et al.*, 2014). However, there are researchers that argue against this stating that there are more efficient tools against climate change and increased yields than GM crops (Jacobsen *et al.*, 2013). One of the advantages, according to Barrows *et al.* (2014), is the fast and precise technique that GM crops offer, compared with conventional plant breeding where it could take years to develop a new variety.

Although researchers cannot reach an agreement weather GM crops are safe from a human health and environmental safety perspective, there are other perspectives that concerns GM to consider. A technical innovation with the potential to change society often receives a great amount of scepticism and there is a trend that society focuses more on the fear of the risks than on the expected benefits (Stilgoe *et al.*, 2013; Leisinger *et al.*, 2002). Porter (1990) argues that the most important step in the innovation process is commercialisation. If the innovation fails to achieve a social acceptance, the innovation will not diffuse. Therefore, it is natural that both consumers' and policy makers' attitudes towards GM crops are well investigated due to their impact of the social acceptance.

2.1.2 GM Policies within the EU and Sweden

The cultivation of GM crops is concentrated to a few countries around the world where US, Brazil, Argentina, India, Canada and China stands for 95 percent of all the GM biomass harvested (Clive, 2012). EU does not cultivate GM crops but depends on imported GM crops, which mainly consists of soybeans for animal feed. EU has also the strictest regulation for food and feed containing GM crops and requires labelling of products that exceed 0.9 percent of unintentional contamination (Davison, 2010). Wohlers (2010) argues that the differences in political culture have had a great impact on the different regulation approaches in EU and US. While policy makers in the US have not changed their view on GM crops existence despite pressure from consumers and NGO, policy makers in EU chose to advocate the precautionary principle (Wohlers, 2010; Löfstedt *et al.*, 2002; Levidow, 2001). The precautionary principle means that when there are uncertainty and lack of scientific consensus about a new technique the use of the technique should be avoided (Sunstein, 2003; Levidow *et al.*, 2000). The aim was to protect both human health and the environment from potential risks of GM crops (Wohlers, 2013). Davison (2010) suggests that policy makers within the EU have taken their decisions regarding GM crops on ideological and political grounds rather than on scientific recommendations. Some researchers argue that European policy makers' attitudes towards GM crops also was affected by the mad cow disease crisis that occurred only a couple of years before the GM debated started (Wohlers, 2010; Toke, 2004).

When US started to export GM soybeans to EU in the middle of the 90's, EU established labelling rules for GM products under the Novel Foods Regulation No. 258/97. The labelling rules are specified in Directive 97/35EC and IP/97/1044 and resulted in that GM crops for food and for animal feed had to be labelled (Wohlers, 2013). This regulation, however, is only applied to products that contain GM directly and excludes products that are a result of animals eating GM feed (Commission, 2003). This means that products such as meat, milk and eggs do not require labelling according to EUs legislation (Wohlers, 2013). Devos *et al.* (2009) argue that this is contradictory since the reason that labelling and traceability of GM crops become mandatory in the first place was to ensure consumers freedom of choice (Devos *et al.*, 2009).

2.1.3 Market Perspective

Consumers' attitudes towards GM crops varies with the context. There are differences among different demographic variables e.g. culture, education, and religion (Ceccoli & Hixon, 2012; Falck-Zepeda & Zambrano, 2011; Frewer *et al.*, 2004). It is well established that European consumers have a more negative attitude to GM crops compared to consumers in North America and developing countries (Finucane & Holup, 2005; Curtis *et al.*, 2004; Gaskell *et al.*, 1999). Different factors are identified that influence consumers' attitudes towards GM crops. A higher level of education and scientific knowledge are factors that tend to give consumers a positive view of GM crops (Frewer *et al.*, 2013; Moerbeek & Casimir, 2005; Vilella-Vila *et al.*, 2005; Moon & Balasubramanian, 2001; Boccaletti & Moro, 2000). Studies have shown that respondents connect GM crops with a risk for negative effect on the environment, a risk for negative effects on their own health and ethical and moral doubts about the GM technique giving them a negative attitude towards GM crops (McFadden & Lusk, 2016; Frewer *et al.*, 2013; Frewer, 2003; Magnusson & Hursti, 2002). There are also concerns that the food industry will give up the safety in order to increase profits and that few companies will control the food supply (Frewer, 2003; Miles & Frewer, 2001). Studies have also shown that women have a greater impact than men on consumers' acceptance of GM crops since it tends to be the women who do the grocery shopping or on the case of that the man does to shopping he follow a list made from his (female) partner (Moerbeek & Casimir, 2005). Since women have shown to have a lower acceptance of GM crops than men the general acceptance of GM crops allows becomes lower (Moerbeek & Casimir, 2005; Frewer *et al.*, 2002). Table 1 illustrates which affects different factors have on consumer's attitudes towards GM crops according to the literature. The factors marked with a plus means a positive connection between the factor and the attitude. The factors marked with a minus means a negative connection. The x factor shows a correlation, neither positive nor negative.

Table 1. *Literature overview, different factors effect on consumers attitude towards GM crops.*

Factors \ Authors	Frewer et al 2013	Moerbeek & Casimir 2005	Vilella-Vila et al 2005	Boccaletti & Moro 2000	McFadden & Lusk 2016	Frewer 2003	Magnusson & Hursti 2001	Miles & Frewer 2001	Frewer et al 2002	Wohlers 2013
Education	+	+	+	+	+		+		+	
Scientific knowledge	+	+	+	+	+	+				
Human Health	-			-		-		-		-
Environment	-					-		-		-
Gender		x					x		x	
Moral doubts	-					-	-			
Profits over safety						-		-		-

As researchers have agreed on many factors affecting consumers attitude towards GM crops there are also contradictory factors. Some studies find that respondents with a higher age tends to be more positive to GM crops (Bauer *et al.*, 1998; Olofsson & Olsson, 1996; Frewer & Shepherd, 1995). Other studies shows the opposite, that younger respondents have a more positive attitude towards GM crops (Koivisto Hursti *et al.*, 2002; Sparks *et al.*, 1994). It is, however, not clear at a time when GM crops are not allowed to be cultivated within the EU, which affect this has on the consumers "type" of attitude and perception of the phenomena. In other words, since to consumers has not experienced GM crops it is harder for the consumer to project their attitude towards GM crops. The most usual modification made in GM crops are that they have a higher tolerance against insecticides or herbicides (Barrows *et al.*, 2014). This was constructed with the aim to lower the food costs for consumers, but such indirect benefits are hard for consumers to understand (Costa-Font *et al.*, 2008). The literature suggest that if GM crops want to have a broader social acceptance, lower cost are not enough but the technology must be used to provide benefits that are clear to the consumers and easy for them to understand (Barrows *et al.*, 2014; Wohlers, 2013; Costa-Font *et al.*, 2008). McFadden and Lusk (2016) showed that consumers who prefer non-GM crops nor wants DNA in their food. This implies a lack of knowledge about the GM technique and basic scientific knowledge according to the authors. Marris *et al.* (2001) found that the respondents neither accepted nor rejected GM crops but that they had "key questions" about GM crops. Many of their questions are concerned with the benefits of GM crops as well as what actors has the power to determine if and how GM crops are developed. This information gap is a ground pillar to the failure of getting a social acceptance and the general public should be involved in the process as a stakeholder group (Frewer, 2003).

As this literature review shows, knowledge about both consumers and policy makers' attitudes towards GM crops is well investigated. However, there are more actors that affect and are affected by GM crops existence. Notably, the perspectives of commercial actors on GM crops is under researched.

2.1.4 A Critical Reflection of the Literature of GM Soybeans

Consumers and policy makers are indeed important actors in the debate of GM soybeans. There are, however, other actors who have an interest in the debate and shape developments of GM soybeans. Many studies have investigated the attitudes of consumers and policy makers towards GM crop. The literature wildly omits firms operating in the feed and food industry. Inghelbrecht *et al.* (2014) investigate how the agribusiness industry in EU deals with the wicked problem of the demand for non-GM products from consumers' perspective. Consumers unawareness that GM crops have been fed to animals and that products such as egg, meat or milk are indirectly a result from GM crops is a result of the lack of information from the industries (Inghelbrecht *et al.*, 2014; Van Eenennaam, 2013). The EU livestock production, which heavily relies on the import of GM soybeans, account for 40 percent of the total value of agriculture production in EU (Van Eenennaam, 2013). Van Eenennaam (2013) concludes that that if GM soybeans are banned as animal feed, it would result in higher prices for animal products and decrease the competitiveness of farmers within the union as well as generating higher import from countries outside of EU is likely. Inghelbrecht *et al.* (2014) draw the conclusion that the industry tackles problems associated with GM crops in three ways. First, GM crops as a way to lowering production costs and provides a comparative advantage. Second, GM crops are a marketing threat, consumers do not wish GM crops in their food and therefore the industry sees a risk to be associated with GM crops. Third, non-GM crops are the end goal for the complete industry (including animal feed). Inghelbrecht *et al.* (2014) also state that managing or solving a wicked problem is a shared responsibility of multiple stakeholder groups. Since the literature omits commercial actors when discussing different matters in the GM soybean research and the commercial actors have a large impact on the development of GM soybeans it is relevant to ask how these actors can be studied.

2.2 Theoretical Perspective

To identify commercial actors on the soybean feed market in Sweden and to get an understanding of the commercial actors' perspective, the following theories that are presented in this chapter will provide a theoretical understanding that will be used in the analysis of the empirical data. First an ethical framework consisting of three different branches but all with a focus on environmental ethics is presented. Second, due to that a wicked problem often includes different stakeholders, a section of stakeholder theory is presented, which is followed by a section of multi-stakeholder networks. At the end of this chapter, the characteristics of the theory of a wicked problem is provided.

2.2.1 Ethics in a GM Context

Frewer *et al.* (1996) argues that social distrust is one of the most important factors that effects the public attitudes towards "genetic engineering as applied to food production" (p 473). In order to gain consumers' trust, organisations must be identified (by the consumers) as unbiased or not to work as self-serving. Therefore, an ethical framework that can identify the commercial actors' standpoint is useful in this study. The ethic approach is also critical due to the controversies when applying a new technique (Frewer & Shepherd, 1995). To understand an ethical issue, such as GMO, the ethical theory provides a common understanding and language (DesJardins, 1997). The ethical theory similarly plays a significant role due to that: "we become more aware of the patterns and assumptions in our way of thinking (DesJardins, 1997, p. 18). Snell (1988) conclude that ethics is the study of moral law, what is morally good or bad. Armstrong and Botzler (1993) means that environmental ethics especially is

embedded in a larger context and involved many different areas such as aesthetic, religious, scientific, economic and political considerations. Within environmental ethics three different approaches is typically used: virtue ethics, deontology and consequentialism (García-Rosell & Moisander, 2007). An overview of the ethical approaches is presented in Table 2.

Table 2. *The theoretical framework used in this study based on Boatright (2009); García-Rosell and Moisander (2007); DesJardins (1997).*

Virtue Ethics	Deontology	Consequentialism
Good people	Good principles	Good effects
What is the underlying **motive** to act?	What is the **action** followed by the motive?	What is the **outcome** of an act?
What kind of person should we be?	We have a duty to perform certain acts	We must think of the consequences

Virtue ethics

Virtue ethics focus on the decision-maker and his or her moral character (Gregorowius *et al.*, 2012; Boatright, 2009; García-Rosell & Moisander, 2007). Instead of focusing on the act itself, virtue ethics focuses on the acting person and if he or she is acting the *right* way (Hursthouse, 2013). Gregorowius *et al.* (2012) define a virtue as "a character trait, state or disposition that allows a person to act in a way that individual and collective well-being is promoted" (p. 268). When a character embodies a commitment to an ethical value (e.g. justice or compassion) and thus provide ethical guidance, it can be titled a virtue. Hence, a person acts for a reason not by a habit (Annas, 2005), i.e. the motive of the action is fundamental. Boatright (2009) discusses some weaknesses when evaluating virtue ethics with some fundamental questions. First its incompleteness and lack of rules. For example, the virtue *honesty.* When does it becomes a lie when you not revealing information to another? Second, conflicting interest. Virtue ethics is based on Aristotle's assumption that "we achieve happiness through a life of virtues" (Boatright, 2009, p. 81). Boatright (2009) contradicts this due to that people's interest conflict.

Deontology

When acting on principles, and not on the consequences, it provides us with the deontological approach (*deon* is Greek for duty and *logos* are Greek for science or study (Alexander & Moore, 2016)). Instead of acting from the perspective of consequences one acts on principles and what is duty and what is right (DesJardins, 1997) and thus a contrast to consequentialist theory even if an act may contribute to massive welfare, it may be morally wrong (Alexander & Moore, 2016). Therefore a maximisation of the good is not the objective (McNaughton & Rawling, 2005) but rather holds that we shall not kill or harm other people, lie etcetera. In an environmental context, the environment "has a moral right to respectful treatment" (García-Rosell & Moisander, 2007, p. 212) and human has a moral duty to protect it (compared with a consequentialist approach where the environment would only be protected if it generates known, overall, good consequences). In other words, the action itself is focal.

Consequentialism

In natural law ethics, the Pauline principle says that the end does not justify the means (Mizzoni, 2010). However, consequentialists denies this principle and states that the end *does* justify the mean (Mizzoni, 2010, p. 104). The reasoning in consequentialist theory advocate that an action is justified if the result is good (García-Rosell & Moisander, 2007) or the action that creates most value is preferable (McNaughton & Rawling, 2005). A consequentialist approach does primarily account for satisfaction and pleasure of human beings, thus the environmental aspect is not attributed (García-Rosell & Moisander, 2007). Webster (1975), describe the socially conscious consumer as "a consumer who takes into account the public consequences of his or her private consumption or who attempts to use his or her purchasing power to bring about social change." (p. 188). The behaviour of the consumer is thus based on its consequences. The foundation of utilitarianism is to maximise the overall good (DesJardins, 1997). It is also important that the overall good being supplied for the greatest number of people. DesJardins (1997) divides the utility into two types of values: *the good* and *all the other things.* The *good* value is in itself valued and the *other* is valued with respect to the relation to the good, i.e. all decisions are made with respect to their utility.

According to DesJardins (1997), a number of challenges arise within the utilitarianism and consequentialism. First, the problem of measurement: Is it possible to quantify a qualitative phrase like "maximise the overall good" and "the greatest good for the greatest number"? Alternatively, how do we quantify happiness, pleasure, or desire? DesJardins (1997) furthermore questions if one can assume that feelings and pleasures are qualitatively alike. To compare utility between different individual is also impossible (Hooker, 1990). It can also be problematic from a consumer policy perspective (García-Rosell & Moisander, 2007; DesJardins, 1997). Even if a consumer does not have the power of controlling their consequences of their act, they are judged by it (DesJardins, 1997). DesJardins (1997) finally questioning how the theory can be implemented in real life with regards to the impossibility of knowing all consequences of an act and stress the question of how to know consequences in the future of an act of today.

2.2.2 Stakeholder Theory

This study investigates a number of commercial actors and their ethical perspective of the use of GM soybeans in the Swedish animal feed market. There commercial actors has objectives which affects and are affected by their stakeholder. In this study, the stakeholder theory has been used to identify different key informant, which provides the empirical data for the thesis. The theory of stakeholders has long been investigated (Tsui, 1990). Rhenman (1968) introduced the concept of stakeholder or constituencies and described how different individuals depend on a company or companies. The definition of a stakeholder is highly debated (Nassreddine *et al.*, 2012) and Mitchell *et al.* (1997) identify 28 different definitions in literature (p. 858) for these definitions see appendix 1. However, Freeman (1984), a well-cited definition, defined a stakeholder of an organisation as "any group or individual who can affect or is affected by the achievement of the organisation's objectives" (p. 46). Later Freeman *et al.* (2010) split the definition into a narrow definition: "those groups without whose support, the business would cease to be viable" (p. 26) that he call primary or definitional. Further Freeman *et al.* (2010) broadens the definition to "a stakeholder is any group or individual that can affect or be affected by the realisation of an organisation's purpose." (p. 26). This broader definition now includes other types of stakeholders for example media, governments and competitors. Freeman *et al.* (2010) label these stakeholders

secondary or instrumental. As the reader may notice, from the definitions, a stakeholder can be a single person, a company, an organisation or several persons, several companies or several organisations. The complexities of defining a company's stakeholder are thus quite clear. Nevertheless, it is clear, in a stakeholder model point of view that a company is not only bounded to account their shareholders but also must be aware and respond to the various impact of their constituencies, investors, customers, and other stakeholders (Freeman *et al.*, 2010; Roloff, 2008b; Roloff, 2008a). However, according to Kotler (2000), a business must define its stakeholder (and their needs) as a "first stop on the road to high performance" (p. 40). Kotler (2000) also make every effort to satisfy every single stakeholder group. Harrison and Freeman (1999) questioning the latter due to the difficulties to fulfil the stakeholders' different demands and gets support by Pedersen (2006), who argues the differences between social and economic goals and how the stakeholders may rank different values contrarily. Kotler (2000) argue that there is a virtuous circle, a dynamic relationship that connects the different stakeholder groups:

> "A smart company creates a high level of employee satisfaction, which leads to higher effort, which leads to higher-quality products and services, which create higher customer satisfaction, which leads to more repeat business, which leads to higher growth and profit, which leads to higher stockholder satisfaction, which leads to more investment, and so on." (Kotler, 2000, p. 41).

Stakeholder theory can be explained in several ways. For example, Donaldson and Preston (1995) explore three different features of stakeholder theory: *descriptive, instrumental* and *normative*. The *descriptive* use of the stakeholder theory is used to describe and explain corporate characteristics and behaviours for example how managers in a firm act (and why), how the board members view stakeholders, and how the organisation is managed. This aspect explains certain conditions of a corporation e.g. future, present and past states of affairs. Donaldson and Preston (1995) define the usage of the *instrumental* feature as "the theory, in conjunction with descriptive/empirical data were available, is used to identify the connections, or lack of connections, between stakeholder management and the achievement of traditional corporate objectives (e.g., profitability, growth)" (p. 71). The last feature, *normative*, are implemented when trying to interpret different functions of a corporation. Moral or philosophical guidelines is also included in this part of the theory, for example, managers do not implement certain decisions because they are wrong. From an *instrumental* feature, a manager would make a certain decision from a hypothetical approach; for instance, adopt a certain principle to achieve a certain result.

Dowling (2001) set up a model and separate the stakeholder into four groups. The model, interpreted by Roberts (2003), is illustrated in Figure 1. *Authorisers,* the group that have a direct (from governments or regulatory agencies) or indirect (from professional societies) influence on the organisation for it to function. The group includes trade associations, thus the group furthermore have a monitoring function and foster normative guidelines. The stakeholder group *Business partners* have a direct influence and facilitate an organisation. The group includes both employees and suppliers. *External influencers* are, as the name implies, not actors within the organisation. Nevertheless, they have an impact on the operation because they influence others, for example, media and community groups. The last group is the *Customer groups.* This group can be divided into several sub groups, due to that; they have a different interest in an organisation. In the context of an organisation the stakeholders may, as explained in the previous paragraph, have different grade of importance.

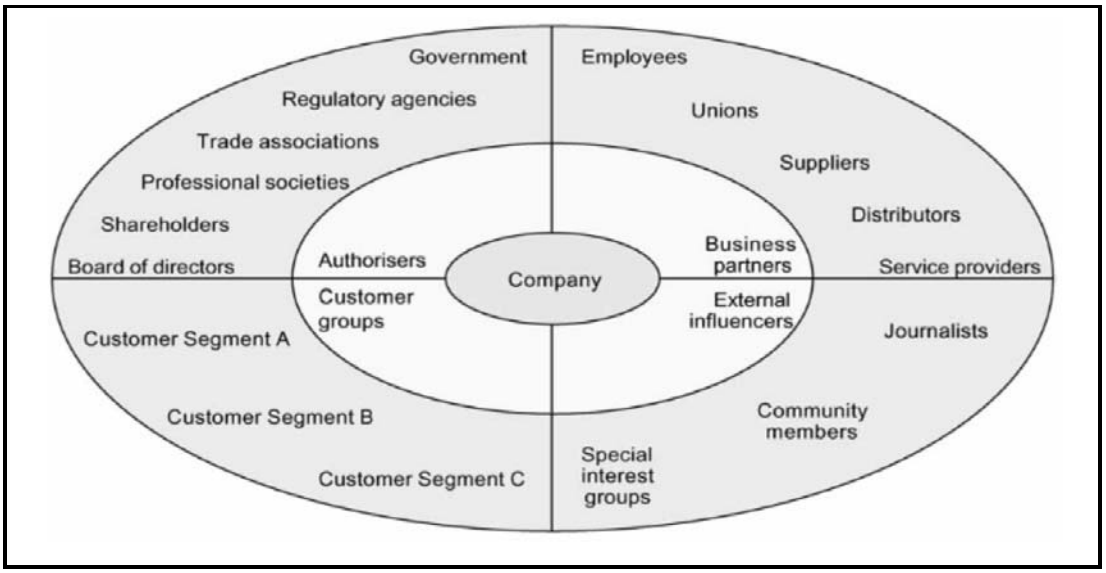

Figure 1. *Corporate Stakeholders (Roberts, 2003, p. 162).*

The stakeholder theory in this thesis follows Roberts (2003) logic, but with some modifications. Instead of putting a firm or organization in focus, the phenomena GM soybeans in animal feed is in the centre. Then the different organizations affecting this was divided into different subgroup depending on their structure for example governmental organizations, private owned companies, media, and lobby organisations. This helped the authors to get an overview and helped them identify key informants. A more thorough description over how this was made will be presented in section 3.3.

Multi-stakeholder network

The figures by both Roberts (2003) and Freeman *et al.* (2007) put the firm in the centre of consideration. Roloff (2008a) argues that most managers cannot, in practice, handle the interactions of the stakeholders. One way of facilitating this problem is to create a multi-stakeholder network, which has increased in popularity since the mid-nineties. In this network, several actors from different stakeholder groups come together to find a mutual approach to the matters that would be too difficult to address without a collaboration (Roloff, 2008a; Roloff, 2008b; Calton & Payne, 2003). It is often suitable to convening a stakeholder network when companies "address complex sustainable and corporate responsibilities issues" (Svendsen & Laberge, 2005, p. 92). Svendsen and Laberge (2005) argue that the mind-set of Freeman (1984) and Mitchell *et al.* (1997) is organisation-centric and states that the relationship among the stakeholders has a tendency to be short-termed. Instead of the organisation-centric, mechanistic view, they advocate a paradigm shift to a network-focused, systems view. Figure 2 illustrates Svendsen and Laberge (2005) shift from an organisation-centric to a network focused approach. In this new paradigm, organisations awareness lies not in small parts of their context but frames a broader picture. Svendsen and Laberge (2005) even state that a stakeholder network is "more than the sum of its parts" (p. 97). However, a stakeholder analysis is never static but dynamic and change often (Reed, 2008). There exists a risk that stakeholders are not correct categorized or up-to-date. A stakeholder analysis is a snapshot of the analysis at one specific moment (Reed, 2008). In this study, however, the network focused view is used to explain that the commercial actors do not relate to the phenomena independently but affects each other and other stakeholders. A multi-stakeholder network can be established to develop solutions to complex problems or to be used in

research to analyse and make sense of complex problems (Svendsen & Laberge, 2005). When applying a multi-stakeholder network, organisations work in an interdependent and symbiotic relationship Andriof *et al.* (2002) which advocate a long-term sustainability within the network Post *et al.* (2002). Nevertheless, Roloff (2008a) stresses that none of the organisations in a multi-stakeholder network has total control and therefore the level of trust and dependence is essential.

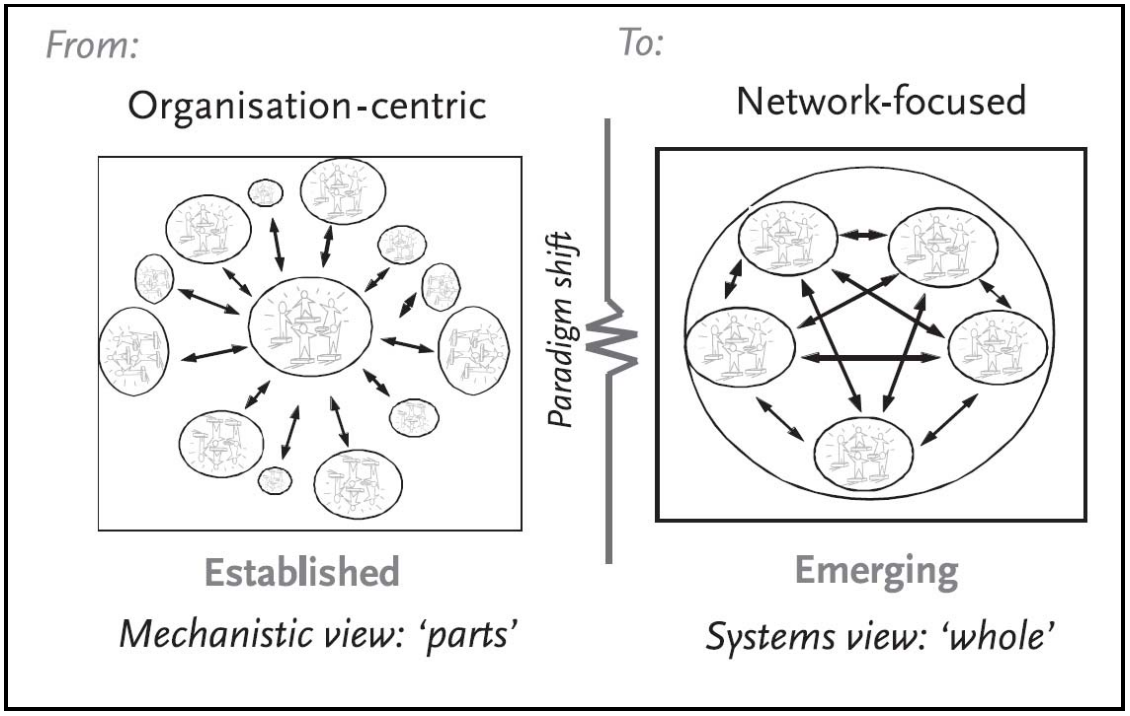

Figure 2. *Shift to systems view in stakeholder engagement (Svendsen & Laberge, 2005, p. 97)*

Stakeholder theory is suitable in this study and is a helpful instrument in the analysis in chapter five. This since Roberts (2000) presents three different strategies when dealing with a wicked problem. Roberts (2000) different strategies are selected on the bases of three questions. A schematic view of the strategies is presented in Figure 3. If it is a wicked problem, the following question is if the power is dispersed. If not, Roberts suggest authoritative strategies. If the power is dispersed, the following question is if the power is contested. If not, a collaborative strategy is advised. An example of a collaborative strategy is the stakeholder theory. If the power is dispersed and contested, Roberts (2000) suggest that a competitive strategy is suitable.

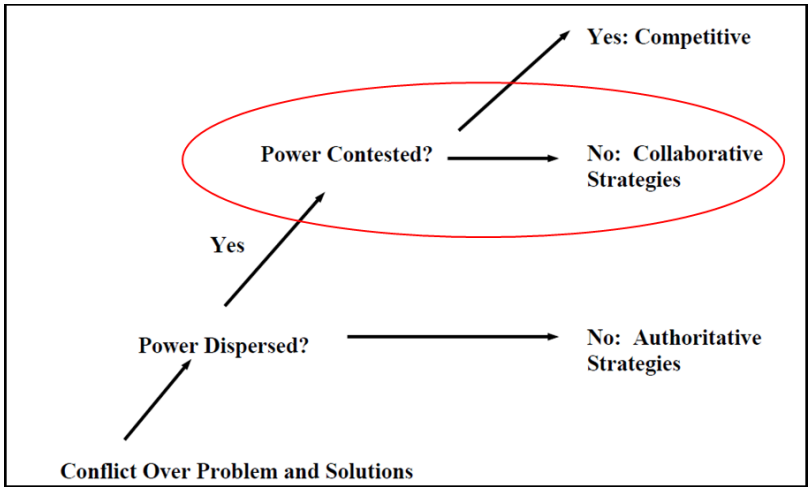

Figure 3. *Strategies coping with a wicked problem (Roberts, 2000, p. 3).*

2.2.3 Wicked Problem

Rittel and Webber (1973) introduced the term wicked in an article about social planning problems. The authors argue that when dealing with social planning problem, traditional linear problem-solving models is not sufficient. The wicked problem is used as a contrast to the tamed problem, which are problems that have a clear mission, a low level of both complexity and diversity (Rittel & Webber, 1973), for example fixing a broken engine. Rittel and Webber (1973) aimed to provide a way of handling wicked problems on a micro-level perspective but are today used to wider economic or social policy problems. The term wicked problem has also been used when dealing with difficult issues which lack a solution within traditional models e.g. in the context of poverty, terrorism and climate change (Dentoni & Peterson, 2011; Camillus, 2008). Waddock (2012) talks about the wicked problem as complex problems, which are hard to define and to resolve. When dealing with the wicked problem, doing nothing is not an option since it will provide neither businesses, humanity nor society closer to a desirable future but in some cases doing nothing will put us even further away (Waddock, 2012). Waddock (2012) also argues that wicked problems have become more common and even more complex since globalisation and the dignity of sustainability issues increases.

The chart shown in Figure 4 describes how both the diversity and the complexity of a problem must meet certain criteria's in order to be viewed on as a true wicked problem (Head & Alford, 2015). Hulme (2009) argues that the first step of reaching a solution to a wicked problem is to understand that traditional models cannot resolve it but need an alternative thinking and behaviour. This is also the reason for why many wicked problems involve multiple parties (stakeholders) as well as the public opinion. In order to handle a wicked problem in a successful way, it is necessary to involve more than one party in a process, which rather should have a long-term perspective than a short-term (Roberts, 2000). Often it is also necessary to lift up and maybe reframe the problem in order to change from a specific definition to a higher abstraction level (Waddock, 2012). This because it is more likely to find a common ground for the stakeholders which increases the participants' motivation to be involved in the process.

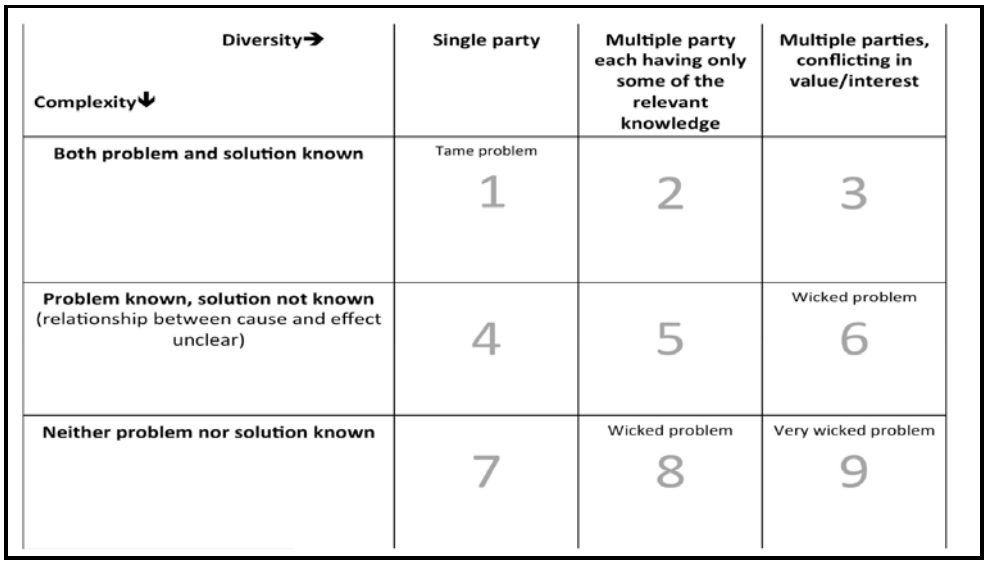

Figure 4. *Chart of wicked problem solutions (Head & Alford, 2015, p. 10).*

Roberts (2000) suggests three different strategies to managing a wicked problem: *authoritative strategies, competitive strategies* and *collaborative strategies.* An authoritative strategy is when few, but powerful, stakeholders have the authority to define the problem and to advocate a solution. The power to do this comes from an advantage in knowledge, expertise, market position or information. Stakeholders that are left outside the process becomes obligated to follow the decisions made of the bigger, more powerful stakeholders. The advantage of an authoritative is a smoother problem-solving process if fewer stakeholders are involved. On the other hand, fewer stakeholders involved in the process increases the risk of one-sided perspective that could lead to bad or wrong decisions. The competitive strategy is based on a binary outcome. If my competitor has the right to define the problem and a solution is chosen, I lose. This is usual in business and forces actors to become more efficient. The competitive strategy lies on that the market will solve or regulate the problem. In contrast to competitive strategy, there is a collaborative strategy, which focuses on a collective solution process, where a success is possible through working together. The advantages of a collaborative strategy are reduced costs and risks. By sharing knowledge among stakeholders, it is more likely to come up with a more valuable result. Of course, the drawbacks with dealing with many stakeholders have increased transaction costs due to more thoughts and ideas to take into account. The process is also expected to take longer time when using a collaborative strategy (Roberts, 2000). Camillus (2008) argues that wicked problems can never be resolved but they can be tamed. One of the greatest challenges when trying to handle a wicked problem is that they have no stopping rule, the search for solutions are an endless process.

2.2.4 Summary

GM crops have been well investigated, and scientific researchers cannot reach an agreement whether GM crops have a positive contribution to the society. When the research community cannot agree on one way to handle GM crops, policy makers chooses to use the precautionary principle in order to avoid negative long-term effects on human health and environment. Policy makers' choice is also a result of consumer's fear of GMO. How different factors affect consumers attitudes towards GM crops are summarised in Table 1. However, there

exists very little academic literature that investigates commercial actor's perspective of GM crops. When it comes to GM soybeans in animal feed it is a phenomenon with a high level of complexity, the problem is known but the solution is not. At the same time, many actors with conflicting interest are involved. Thus, the phenomena can be view as a wicked problem. Stakeholder theory is close associated with the concept of wicked problem, and since the academic literature omits commercial actors, an investigation of commercial actors' perspective is needed. This study uses the ethical framework presented in table 2 to investigate commercial actor's perspective of using GM soybeans in animal feed.

3 Method

The following chapter aims to give the reader an understanding of the choices of design, selection of cases and of the quality the study. The motivation from why choices are made will also be provided. The purpose of this chapter is also to ensure that the research process is transparent and that possible biases of the researchers have been taking into consideration. In the last part, different ethical aspect of this study is considered, both with regard to ethical aspects when collecting data but also with regard to the GM questions itself.

3.1 Research Design

The research design is important to decrease the risk of drawing incorrect fundamental implication from data (Vaus, 2001). Social research needs design as a structure for data collecting and analysis. Depending on a study's research approach different strategies can be used (Bryman, 2011). The three most common approaches are a qualitative, quantitative and mixed strategy (Fetters *et al.*, 2013). The distinction between a qualitative and a quantitative approach lies in how social theory is employed (Bryman & Bell, 2013). Figure 5 shows how theory is viewed upon from the different approaches. Quantitative research has a deductive reasoning which means that the research starting point is theory from which the hypotheses is formulated to be tested empirically. This divide quantitative from qualitative research, which has an inductive approach. An inductive approach has its start in a social phenomenon that is to be observed with the purpose to discover empirical patterns that can be used to form or create a new theory (Boeije, 2009).

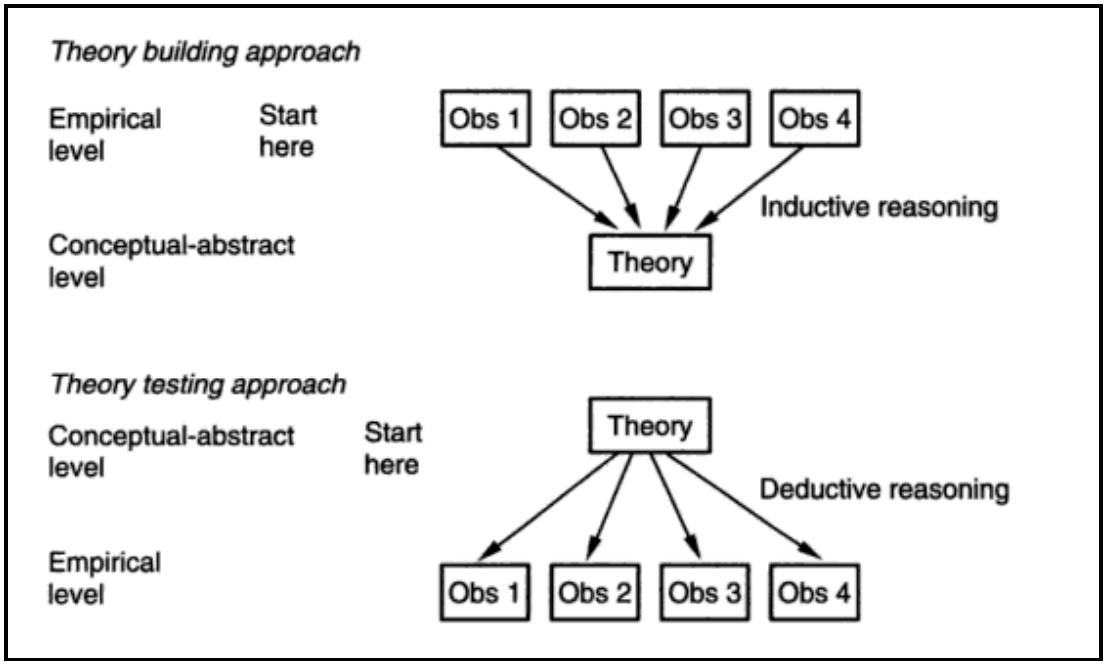

Figure 5. *Theory building and theory testing approaches to research (Vaus, 2001, p. 6).*

An inductive approach will be used in this study. Bryman (2011) argues that theory building starts with observations. When observing new or less explored phenomena this inductive approach can be especially suitable (Bryman, 2011; Robson, 2011). Despite that GMO is an

intensive and highly debated subject, there are few studies made focusing on other stakeholders than the consumers and policy makers. When considering this, this study does not have a natural hypothesis but is open to the understanding and findings that the empirical data provides. When conducting a study in a field were little research have been done, Robson (2011) argues that the use of a qualitative research approach, with an inductive reasoning, is desirable. The logic of the research process is also illustrated in Figure 6.

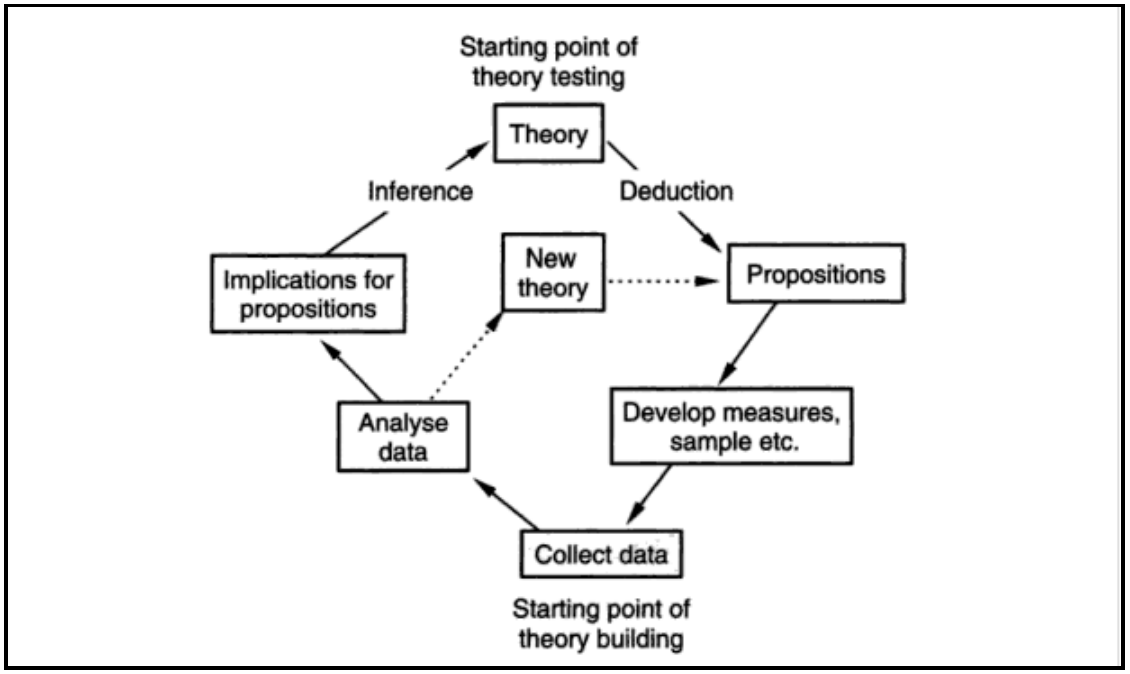

Figure 6. *The logic of the research process (Vaus, 2001, p. 8).*

This study will follow Robson's (2011) flexible research design. A flexible research design is characterised by its use of methods that results in qualitative data (most usually in form of words rather than numbers) and it is a continuing process that evolves and develops as long as the research proceeds (Robson, 2011). Since the aim of this study is to investigate commercial actors' ethical perspective of the use of GM soybeans in the Swedish animal feed market and has as a goal to get a get a better contextual understanding of the commercial actors' view, it would not be possible to measure this view quantitatively and perceive the different perspectives on the subject. The subject can rather be understood through a qualitative method. The focus lies in the analysis of the qualitative data. The qualitative data is rich and descriptive and needs further interpretation to contribute to a theoretical knowledge (Hennie, 2010). The data is analysed to explore the potential of GM soybeans and to understand the social phenomenon of GM soybeans in the Swedish feed market.

3.2 Case Study Research

In order to get an understanding of a dynamic present in a specific context a case study research design is preferred (Eisenhardt, 1989). A case study can be defined as an elaboration of focused and intensive knowledge about one individual case or a small number of cases that is similar which is called comparative case study (Dul & Hak, 2007). Yin (2009) argue that one case could provide more focused and intensive information about one specific case or phenomena compared to when using a number of cases. However, a comparative case study

was chosen to get a deeper understanding of the different perspectives which the cases may have. Further Luck *et al.* (2006) define a case study as a "detailed, intensive study of a particular contextual, and bounded, phenomena that are undertaken in real life situations" (p. 104). Thus, a case study may not only be one specific case but may be several (Bryman & Bell, 2013; Yin, 2009; Eisenhardt, 1989) a so-called collective case study (Cousin, 2005). According to Cousin (2005), the collective case study may accomplish some kind of generalizable result although it is not always the main interest of a researcher conducting a case study. On the contrary, a case study is justified when a researcher's aim is to analyse a specific phenomenon and thus the researcher cannot generalise the result due to the limited data (Easton, 2010) and the study will have a low statistical relevance (Gerring, 2004).

Even if case study research is common, there is not any set of methods when conducting a case study that is agreed by researchers (Luck *et al.*, 2006; Gerring, 2004). Although there is no agreement among researchers about the definition of case study research. Yin (2009) states that a case study is to prefer when studying a contemporary social phenomenon and when the researcher cannot control the event in the study. The aim of this study is to investigate commercial actors' ethical perspective of the use of GM soybeans in the Swedish animal feed market, which can be viewed as a contemporary social phenomenon and the researchers cannot control the event in this study. A social phenomenon cannot be removed from its context and in this case, GM soybeans in the Swedish animal feed market, the context can be difficult to account for if looking at just one firm or one commercial actor. Therefore, this study's objective is to study the context of Swedish commercial actors in the animal feed market. Therefor a comparative case study was chosen for the basis of the empirical data. Since Yin's (2009) condition are fulfilled, it can be argued that a case study is a suitable method for this study. By studying several actors in the Swedish soybean feed market, we get a deeper knowledge of this contextual phenomenon.

3.3 Selecting Cases and Key Informants

Much can be discussed about the number of samples in a case study. Mintzberg (1979) argue that a simpler methodology constructs a more valuable result and summarising: what is wrong "for a physicist for splitting only one atom?" (Mintzberg, 1979, p. 583). Hence we in this study are interested in focusing on the unique context of the commercial actors – a multiple case study is preferred (Bryman & Bell, 2013). By interviewing several key informants, the researchers do not get a single view through one lens, but a number of lenses, which allows us to get several aspects within the phenomenon (Baxter & Jack, 2008) and thus get the rich and descriptive data needed to conduct this study. Eisenhardt (1989) argues that "a number between four and ten cases usually works well" (p. 545). With a number over ten, the research will contain a large amount of complex data and will be challenging to manage.

The aim of this study is to investigate commercial actors' ethical perspective of the use of GM soybeans in the Swedish animal feed market. A stakeholder analysis was made, see Figure 7, in order to provide the authors with an overview over relevant stakeholders and to enable a purposive strategy in the process of selecting commercial actors to investigate. In Figure7, the stakeholder how, through the purposive strategy, that was selected is circled.

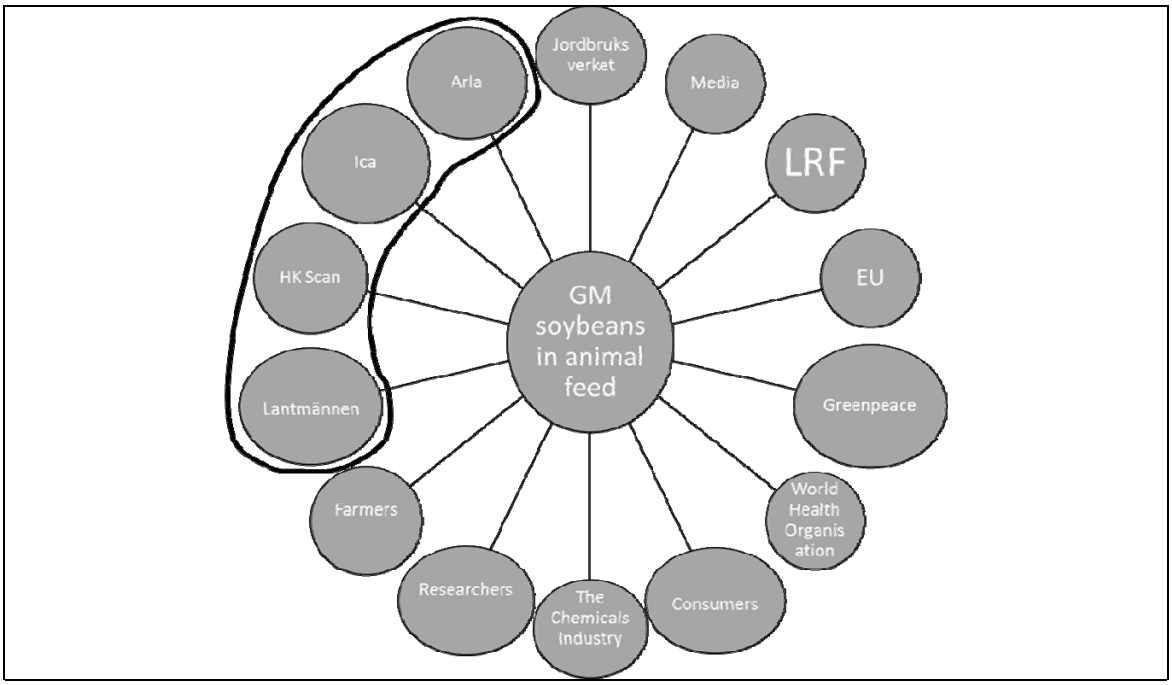

Figure 7. *The stakeholder analysis with GM soybeans in animal feed in the centre, based on Roberts (2003)*

The commercial actors are also a part of an existing multi stakeholder network The Swedish Soy Dialogue, hereafter the Soy Dialogue. The Soy Dialogue is an agreement were different companies and organisations has agreed to use only Round Table Sustainable Soy (RTRS) certified soy. RTRS is a certification that should guarantee that national regulations are followed, that farmers work in sustainable working conditions and that land is used in a sustainable way. It however, does not cover any rules or discussion about GMO. After the stakeholder analysis and looking at the Soy Dialogue a purposive sampling strategy has been used. Tongco (2007) argues that purposive sampling strategy can be useful when conducting sample from a small population. The purposive strategy means that the researcher defines certain criteria's that the cases should fulfil in order to separate the most useful cases. It also means that it is an non-probability sampling (Tongco, 2007). Morse (1991) argues that the researcher through purposive sampling can find respondents suitable to match the needs of the study. This study has used a purposive sampling strategy with the basis from the Soy Dialogue and in appendix 2 the criterions and selection of cases are being presented. To ensure the study's trustworthiness it is important to describe the criteria's and to be aware that the purposive strategy is a bias one and do not try to mimic the interpretations of a sampled population.

In order to fulfil this study's aim, different key informants will be asked to give their perspective upon the use of GM soybean in the Swedish animal feed market. This study has identified four different key informants who will provide the study with a contextual knowledge of the cases chosen throughout the purposive strategy. These key informants will serve as the empirical basis for this study. When identifying key informants, Marshall (1996) argues that there are five characteristics that are important that a key informant have. Role in community, which means that their formal role is such that it gives them access to the information that the researcher is looking for. Knowledge, except having access to the information the key informant should also have taken in the information. Willingness, the key informants should share the knowledge they have. Communicability, when they share the

knowledge they have, they should be able to communicate the knowledge in such a way that the research can understand it fully. The last characteristics is impartiality, which is the form that the key informant should be unbiased. According to Marshall (1996) the key informant should notify the researcher of eventual biases. The aspects of unbiased of both key informants and the researchers themselves are further discussed in paragraph 3.6 Quality Assurance. Since all the key informants fulfil the criteria's according to Marshall (1996) they can be viewed as suitable. Of course, the impartiality of the key informants can be discussed, depending on how the term biases are interpreted. In this study, it is interpreted that the key informants' do not have any hidden agenda when answering the questions during the interviews.

The key informants were chosen due to their role and position in organisations that has been identified as one of the commercial actors in the case of GM soybeans in the Swedish animal feed market. Figure 8 illustrates an overview over the unit of analysis, commercial actors and the key informants of this study. All the key informants' companies have been active in the debate regarding GM soybeans existence in Sweden throughout media and have shown to be interested in the subject. All of the selected companies have a communication on their websites regarding their view on GMO and GM soybeans in particularly, which shows that they have an opinion on, and an understanding for, GM products. None of the companies owns any soybean producers, but they are buyers of products that include (today non-GM) soybeans in the production process. One of the companies is a supplier of the commodity and have a great knowledge about how the cultivation and the market for both non-GM and GM soybeans work. One of the other companies owns a chain of food stores and can provide a perspective from a sales point of view. The other two companies are both industry companies that processes products and delivers the products to groceries. They provide knowledge of how different solutions may look and how their opinion has varied during the last decade.

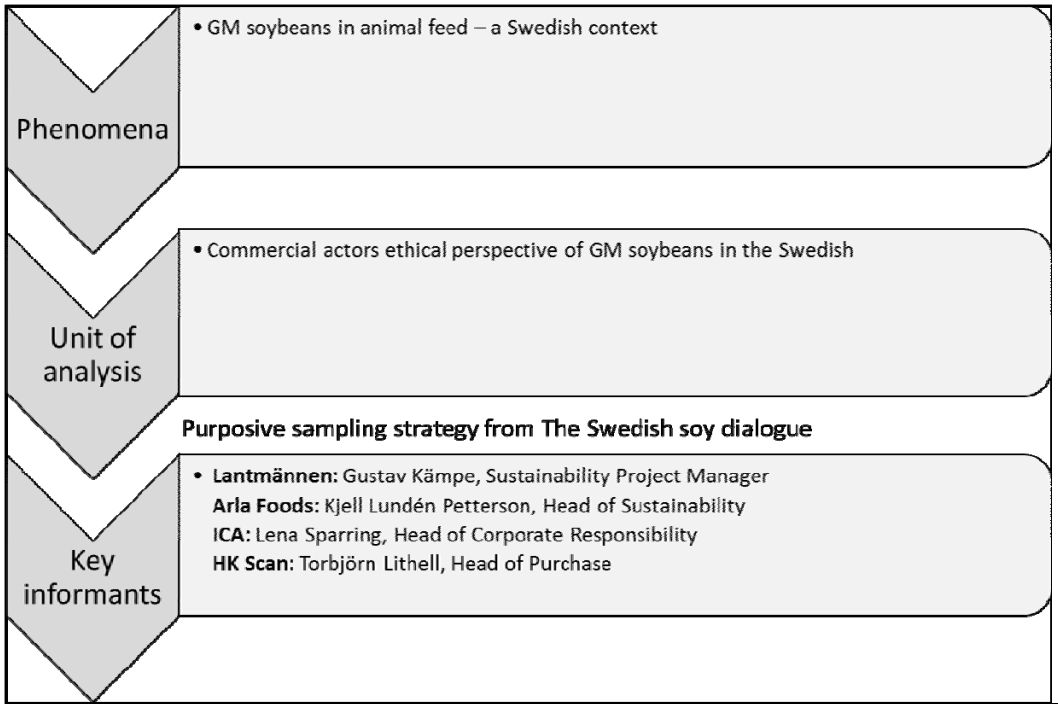

Figure 8. *An overview over the phenomena, the unit of analysis, and the key informants in this study.*

All the respondents have in their daily work connections to these questions and have an in-depth knowledge about GM soybeans although they have different roles in each of the companies. They have a deep understanding of different issues connected to soybeans in general but also concerning GM soybeans. All the companies are profit-driven organisations, which means that the information they share is from a business-originated perspective. All interviews were conducted to get an understanding of different perspectives companies can have and how they look upon each other's responsibility in these questions.

GM soybeans in the Swedish animal feed market do not necessarily need a legal approval, but a social approval for its innovation process to proceed. In order to reach this social approval, social aspects are important not only for policy makers and consumers perspective but also from the industries perspective. When trying to get a contextual understanding of this social phenomena the chosen actors provides important information and are crucial for the data collection. In this study, the key informants were identified and chosen due to their membership in the Soy Dialogue and thereafter a purposive sampling strategy was carried out.

3.4 Data Collection – Interviews

When conducting a case study it is common to collect data through e.g. interviews, surveys, review of archives or observations (Eisenhardt, 1989). This study aims to analyse a specific phenomenon, the commercial actors' ethical perspective of the use of GM soybeans in the Swedish animal feed market. Primary data will be collected mainly directly from the source by interviewing various key informants at the different stakeholders in our specific context, which is common in case study research (Robson, 2011; Yin, 2009; Eisenhardt, 1989).

The key to a successful data collection through semi-structured interviews is a well-designed interview guide (Bryman, 2011). Semi-structured interviews offer an open approach for the researcher to respond to the respondent's answer and to come up with new questions which may lead to further discussion, more exhaustive answers and focuses on what the respondent finds important (Bryman, 2011). Therefore, there is a possibility that different interviews have different focuses, as the respondents have the possibility to talk more about subjects that they find of special interest. This increases the possibility for respondents' lifts aspects that have not been highlighted in the literature earlier. If this occurs it is important that the researcher askes follow-up questions to clarify these aspects (Kvale & Brinkmann, 2014). Kvale and Brinkmann (2014) argues that in order to facilitate the analysis the interview must hold a certain quality. In order to reach a sufficient quality of interviews spontaneous, rich and specific answers together with the possibility for the respondent to answer freely is necessary (Kvale & Brinkmann, 2014). Therefore, this study uses semi-structured interview to collect the empirical data.

Telephone interviews give the research the possibility to collect data from respondents regardless of their geographical location and are a cheap solution. Robson (2011) argues that telephone interviews could reduce bias due to eventual facial expressions from the research when hearing an answer. At the same time, it can be argued that the researcher misses out on important observations of non-verbal responses which could have led to further questions which is one of the main advantages with face-to-face interviews (Bryman & Bell, 2013). In this study, both telephone and face-to-face interviews have been used to collect data. In both cases, the place for the interview has been chosen by the respondent, which increase the

chance that the respondent feels comfortable in the situation and can focus on the interview (Robson, 2011). Even if face-to-face interviews would have been preferable due to the chance of following up on non-verbal expressions, the priority has been to get data from those key informants who have been identified as holding the most, for this study, valuable information.

In order to collect a sufficient amount of data to analyse, four different key informants from different commercial actors have been interviewed. The empirical data has been collected through semi-structured interviews by both telephone and at the key informant's offices. With permission from the respondents, all the interviews were recorded to give the researchers the possibility to go through the answers again in order to avoid misinterpretations and produce a correct data. During the interviews, notes were taken in order to give a direct picture of similarities and differences between the respondent's answers. This gives the possibility to ask follow-up questions if there are questions that need to be clarified. In order to give the researchers a clear picture of the interview the data were transcribed. Bryman and Bell (2013) argues that the process of transcription reduces the risk of that the researcher make their own interpretations after the interview and thus effects the data. Therefore, transcription increase the quality of the data. Since the questions about GM soybeans are highly infected and the debate is strong, the respondents were in the introduction of the interview clearly informed that this study does not investigate the existence or non-existence of GMO.

Trost (2010) provides a three-way step on how to process the data: collecting, analysing and interpretation. Collecting is to summarise and structure the empirical data. Then the data, by using existing knowledge within the field, are analysed. Some researchers argues that the analysis should take place directly after the interviews (Kvale, 1996). Trost (2010), however, argue that even if there are not any clear rules or law of how it must be done, it is preferable to get some distance between the interviews and the analysis. When doing the analysis, it is important that the researcher looks for patterns and uses ingenuity to create an understanding. In the third and last step, the data is connected with the chosen theory and the researcher explains the interpretations made (Trost, 2010). In this study, the empirical data was collected through semi-structured interviews. Thereafter the data were transcribed and analysed. The analysis was made a couple of days after the data was collected to get some distance to the data. Further, the analysis was made by trying to identify those themes that were presented during the interviews. The themes were connected to theory and interpretations was explained.

The interview guide should contain fairly specific themes that the researcher tries to cover during the interview (Bryman & Bell, 2013). These themes have been identified from the literature review and to through the analysis answer the research questions. Before interviewing the respondents in this study, a pre-interview with a respondent was made. This respondent was not aware that this interview only was made for testing the interview guide. After the pre-interview, the interview guide was evaluated and revised to fit better with this study's aim. This study's interview guide can be found in Appendix 3 at the end of this paper to give the reader the possibility to see the themes and which questions that have been asked. It also provides the reader with the possibility to determine how the reliability and trustworthiness may have been affected in this study.

3.5 Literature Review

A literature review is a tool for researchers to understand what has been done within the field of interest and to develop a theoretical understanding and perspective (Fetters *et al.*, 2013). It also gives the research an understanding of the current situation. By allowing the researcher to identify theoretical gaps in the existing literature it gives the researcher an opportunity to frame his or hers own research within the field (Boeije, 2009). Further, a literature review provides different perspectives and angles of a problem to the researcher (Bryman, 2011). The aim of the literature review is to create an understanding of what already has been done within the field in order to avoid that the research focuses on known aspects instead of creating new knowledge (Starrin & Renck, 1996). A literature review should present a description of the current state of knowledge without the researchers affecting the compilation (Bryman & Bell, 2013). Further means Bryman and Bell (2013) that the literature review should show and argue for why the research's questions formulated in the study is important and relevant. The goal of the literature review is to present a nuanced picture for the reader of the current knowledge state in the existing literature.

There are, however, two different ways of conducting literature to research: systematic and narrative (Bryman, 2011). A systematic review aims to be replicable and transparent in order to be objective and minimise possible biases of the researcher. Critics against the systematic review are that it focuses more on technicalities of the literature search rather than on the analytical interpretations of the literature (Bryman & Bell, 2013). An alternative to a systematic review is the narrative review. The narrative review is less strict in its form and focuses more on the process of giving the researcher an understanding of the field that is investigated. Since it can be difficult to determine the theoretical terms within the field prior to the data collection, a narrative review allows the research to follow the process which can lead to a new and unexpected understanding of the subject (Yin, 2004; Noblit & Hare, 1988). This study focuses on understanding a social phenomenon and to identify eventual differences among intermediaries from different theoretical approaches to stakeholder theory and ethical consequentialism with the use of a narrative literature review.

The literature in this study has been collected from databases that are provided by the Swedish University of Agriculture Science. By focusing on mainly peer-reviewed articles, it can be argued that the scientific quality was validated. The databases used are mainly Primo, Web of Science and Google Scholar. Keywords that were used when searching for literature was *genetically modified, crops, consumer, attitudes, innovation as a social process, biotechnology, animal feed, stakeholder, multi-stakeholder collaboration, value chain, ethics, ethical consequentialism*. These keywords were identified as interesting with regard to the study's aim and research questions. The number of citations and relevance has sorted the search hits. Interesting articles has been read and a short summary has been made. Thereafter has these articles list of references been view in order to find more articles within the same field. This way of conducting literature is referred to as the "snowball method" (Bryman *et al.*, 2004). By doing this broad spectrum of theory has been conducted which will be used to analyse the empirical data. Factors identified in the literature review has been used as a basis for the interview guide even if the interviews have been open for further and deeper discussions. The aim with the literature search was to find existent research within the field and to increase the readers understanding of the complex phenomenon that the study tries to deal with.

3.6 Quality Assurance

Research must be rigour and without it, it is "worthless, becomes fiction, and loses its utility." (Morse *et al.*, 2002, p. 14). Quantitative research has a standardised way of evaluating the quality of the research through reliability and validity (Bryman & Bell, 2013). The same standardised measurement do not exist for qualitative research since qualitative research have a constructionism view were the reality cannot be view as certain but only can be experienced hence there exist no absolute reality (Bryman & Bell, 2013). Therefore, different researchers argue for different ways of evaluating qualitative research. For example, Yin (2009) proposes that reliability and validity are suitable to evaluate case studies and suggests how the criteria's can be meet while Stake (1995) argues that the concepts are not appropriate. Guba and Lincoln (1994), however, presents trustworthiness and authenticity as two main concepts for evaluating qualitative research. Bryman and Bell (2013) finds that Guba and Lincoln (1994) concept can be used to measure the quality of qualitative research. Trustworthiness and authenticity are used to explain the probability of reaching similar results if the study were replicated. They show how the study's aim and conclusion relate to each other (Bryman & Bell, 2013). In order to paint the reader a picture of the quality assurance of this paper a discussing reviewing of trustworthiness and authenticity will follow.

3.6.1 Trustworthiness

Guba and Lincoln (1994) divides trustworthiness into four subcategories: credibility, transferability, dependability and confirmability. Credibility is a measurement for if the study is trustworthy in the reader's eyes. Since it can exist many descriptions of the social realities, it gets important for the researchers to show that the study in fact reflects the respondents and their social reality. One way of increasing the credibility is to carry through a respondent validation. A respondent validation is to give the respondents a chance to read through the text from the empirical data to ensure that the researcher interpretations match the respondents' reality (Bryman & Bell, 2013). In this study, the respondents received the transcribed interview on mail and were given the opportunity to correct misunderstandings or errors in the researcher's interpretations. This means that the respondents have confirmed that the empirical data gives a correct picture of the respondent's reality.

If the results from a study can be transferred to another context than the social context that is investigated, transferability is reached (Bryman & Bell, 2013). However, since qualitative research focus more on giving a contextual understanding than replication ability the researcher must put effort into producing thick descriptions of the context. Nevertheless, LeCompte and Goetz (1982) emphasise that in order to replicate a research the other researcher must develop a "corresponding social position or have research partners who can do so" (p. 37). Bryman and Bell (2013) on the other hand mean that it is only possible for the reader to determine whether the results are transferable to another context if the researchers provide the reader with a thick and rich description about the empirical data and the respondent's perspectives. Chapter four, where the empirical data is presented, in this study aims to give the reader an understanding for which contextual reality the respondents work in.

Dependability is to ensure that the researchers create a complete description of all the different parts of the research process, including problem, selection of respondents, interview data and decisions that can have an effect on the analysis (Bryman & Bell, 2013). The objective of the method chapter in this study is to give the reader this description of the research process.

Since it is practically impossible for a researcher in social science to be completely objective, confirmability exists in order to ensure that the researchers have acted in honesty (Bryman & Bell, 2013). In other words, it shall be clear that the researchers have not consciously, with personal values or theoretical orientation affected the research or the conclusions, which can be a risk in qualitative research (Bryman & Bell, 2013). Guba and Lincoln (1994) argues that one of the responsibilities of the reader is to determine in which extent the results are confirmable. To facilitate for the reader, this study's confirmability is strengthened by reading through of both other students and by the supervisor.

3.6.2 Authenticity

Authenticity is to provide a fair picture of the respondents perspective, opinions and conditions (Bryman & Bell, 2013). By doing this in a correct way, a fair picture is created and authenticity is strengthened. To ensure that a fair picture has been given a respondent validation has been made. The respondent validations erased misunderstandings and errors made in the interpretation made of the researchers. Authenticity is also that truthful and genuine answers are given from the respondents to the researchers of their perspectives (Bryman & Bell, 2013). It is difficult to control the authenticity in this study since there exists a risk that the respondents want to give a more favourable picture of their perspective than their reality really is. Even if it is hard to know for sure the researchers' experience was that the respondents answer truthfully and to their best ability.

3.7 Critique of Method

Qualitative research is often criticised for the large role the researcher has and that the empirical data can be effected of perceptions and opinions of the researcher (Bryman & Bell, 2013). Especially when conducting the empirical data there is a risk that the researcher unconsciously focuses on aspects that the researcher finds interesting. Researchers who argues for quantitative research often describe qualitative research as subjective and impressionistic. The critique is built upon the fact that qualitative analysis depends on the researcher's ability to identify and create patterns in the empirical data, which makes it difficult to replicate. Replication is an important quality measurement in quantitative research. Although, Alvesson (2009) argues that the qualitative research are a result of interpretation of empirical data and replication by nature is impossible and the critique, therefore, is irrelevant. Bryman and Bell (2013) on the other hand argues that the critique can be relevant but proposes that it exists possibilities for the researcher to handle in a way that minimises the influence the research has on the study.

In order to minimise the researchers' influence on the result of this study, the interviews have had an open approach to give the respondents a possibility to discuss issue and perspective they think are important. However, this does not exclude the possibility that the answers have been affected by other factors than how the questions were asked and formulated. When conducting empirical data through semi-structured interviews there exists a risk of the researcher's interpretation is affected by the own perception of the questions asked (Bryman & Bell, 2013). In other words, the research had a thought with the question asked and therefore look after answers that fit into this thought. To reduce this risk, the interviews were transcribed and a respondent validation was made.

It is not possible to draw any statistical generalisations from this study since the respondents and their unique context reflects the result (Bryman & Bell, 2013). However, it is still possible to draw analytical generalisations, which can provide insights in other context as well (Robson, 2011; Yin, 2009). In order to make statistical generalisations, a larger sample is necessary together with a quantitative research design. If a quantitative research design were to be used, there is a risk that perspective and underlying opinions are not considered.

3.8 Ethics

When doing research. it is important to consider several ethical aspects. Four main factors are critical for the researchers to reflect upon: the role of the researchers, consequences, confidentiality and information consent (Kvale, 2009). All the respondents in this study were given information about the study's aim and purpose before they were asked to participate. They also received the information that the study was voluntary and that they could withdraw from the study whenever they wanted. All respondents represented their company's policy, statement and/or view upon the questions asked. The respondents were asked if they agreed to be published with their own and their company's name, which everyone was. This increases the transparency that Eisenhardt (1989) mean is important. The respondents were given the opportunity to validate the text and change statements if they felt that the first text did not represent the company's opinion or perspective. The validation was also made to reduce the risk of negative consequences for the respondents in the study. The information was clear to the respondents that their opinions or statements were not to be used in other studies but this one. Therefore, an ethical perspective has been taken without having an impact on the study's result.

The debate on GMO are infected and many people have numerous opinions, both advantages and drawbacks with the technique. It can be argued a lot about the ethical aspects of this technique but the authors have chosen to look past the ethical discussion since this study do not aim to clarify the existence or non-existence of GMO. Nevertheless, the authors want to explain their view of GMO to give the reader a better understanding of the various effects this may have had in the study and which "glasses" to put on. The authors' view is that GMO is not something that can be divided into "good" or "bad". Like any other technology, GMO has its pros and cons. Just like electricity can give us light, it has also been used to execute people in the electric chair. The authors believe that GMO is a technique that may contribute to the society's welfare but it must be used wisely. Our opinion is that we should look past the technique and instead look upon the results raised from GMO and evaluate the individual organism from its benefits and problems rather than to throw it away because of how it was made.

4 Empirical Study

This study uses a comparative case study through key informants in order to develop an understanding for how they perceive the wicked problem of GM soybeans in the Swedish animal feed market from an ethical perspective. The identified key informants each represent one case and provides four different perspectives regarding GM soybeans in animal feed in Sweden for their firm. The structure will follow the same logic as chapter 2.2, theoretical perspective. First, the key informants give their view on the GM technique and their view on the issue regarding GM soybeans in animal feed in the Swedish market. Second, the reader is provided with how the key informants' organisation interacts with stakeholders on the market. Third, and last, a summary is presented of the key informants' perception of the consequences of consumers and producers perspective.

4.1 ICA

With of over 2 100 grocery stores and 104 billion Swedish kronor in turnover ICA is one of Sweden's largest actors in the grocery business and accounting for approximately 50 percent of the food market in Sweden. ICA has a special organisation structure where the store manager owns his/her grocery store by him/herself. The store manager can choose to purchase products from where ever he or she wishes but has a contract with ICA central how often can present favourable prices. Lena Sparring is head of CR overall purchases. In her job, she focuses on assuring that all products and suppliers follow ICAs quality standards that involve sustainability and labelling issues.

When discussing ICA it is important to keep in mind that the independent store manager him/herself decides which assortment that exists on the shelves. ICA can only control the product that comes through their central distribution and has nothing to do if a grocery owner decides to purchase products outside of ICAs central assortment.

4.1.1 Motivation

In general, ICA has a positive attitude to a technique that can provide their consumers with improved products. GMO could be a part of this improvement. However, at this point, ICA does not recognise a utility from the GMO technique that would benefit their customers and have therefor no motivation to push for a change. Also, as some consumers have a firm opinion about not purchasing GMO products and another group of consumers does not actively demand it, ICA at this time does not have GMO product in their assortment. Further, ICA emphasises that if a product containing GMO would have a place in their assortment, the board of directors must approve such an introduction. However, if a store manager wants to purchase a product outside ICAs assortment containing GMO, ICA does not have any opinion regarding such a purchase. According to ICA, the existing legislation regarding GMO in food set by EU is sufficient and agrees with the legislations about labelling GM food. ICA also believes that animal products from animals that have been given for example GM soybeans do not have to be labelled since there are no traces of the GMO in the meat.

4.1.2 Production

ICA is a member of Round Table Responsible Soy (RTRS). The certification, RTRS, ensures that the soy is produced according to national regulations, that farmers work in sustainable

environments and that the land is used in a sustainable way. RTRS do not cover any rules or discussion about GM or non-GM in the production. Thus, ICA supports a sustainable production of soybeans. According to ICA, a certification of a product is important to establish trust and does not have any objection to a certified product that contains GMO. The certification process is essential due to that ICA wants to be guaranteed that products in their assortment are produced in a sustainable way.

As a member of the Soy Dialogue, ICA experience that they work with an important issue, which is appreciated by their customers although this was not the main reason for ICA to join the dialogue. The main reason was that ICA wanted to contribute to a more sustainable production of soybeans. It is quite unusual for ICA to be a part of this kind of initiative. Nevertheless, ICA felt that it was an important step for the organisation to take and to support a more sustainable soy production since the production has had environmental and social controversies. Further, when it was many actors supporting the dialogue, ICA felt that it was important to interact with other actors in the market that also recognise the controversies. Although other actors in the Soy Dialogue may believe that ICA has a requirement for animal products that has not been given GM feed, this is not the case. ICA has no such formal requirement and believes that this might be a misunderstanding from historical discussions.

4.1.3 Consequences

Even if ICA does not have a standpoint that excludes GM products in their assortment, ICA believes that it is of greater importance that they can follow the entire supply chain of the products and thus guarantee that the products actually follows ICAs quality assurance. ICA does not view the issue as only an issue for the consumers to solve but instead as an issue for the organisation as such to handle. Especially since many consumers has low awareness of the GM issue ICA argue that it is important that actors with greater knowledge handle the issue. This can be a problem if consumers demand a labelling of products that does not contains GM soybeans in the production of e.g. meat or dairy products. This especially since it is important for ICA that consumers can trust ICAs quality assurance. However, based on ICAs consumer surveys, consumers no longer have the same interest of the GMO issue as before. Today, according to ICAs own surveys, consumers think that a sustainable food production is more important than the method used to produce it, as long as the method is sustainable.

4.2 Arla Foods

The history of the cooperation Arla dates back to 1880 when the two brothers Wilhelm and Hildemar Albin Lindholm formed *Stockholms Mjölkförsäljningsaktiebolag* (Stockholm Dairy Sales Limited). By the year 1915, the cooperation Lantmännens Mjölkförsäljningsförening was formed. The name changed to *Mjölkcentralen* in 1927 and during the 20th century, there were several mergers with different dairy cooperation's in Sweden. In 1975, the name Arla was registered. The present name, Arla Foods, was formed in the year 2000 when Arla merged with MD Foods, a Danish dairy cooperation. Today Arla Foods is the seventh biggest dairy cooperation in the world and has 13 413 owners by the year 2014. They have production in 13 countries, sales in 20 countries and approximately 19 000 employees. The cooperation handles 12.7 billion kilos of milk every year.

Kjell Lundén Pettersson, head of sustainability at Arla Foods, works at the Corporate Sustainability Unit where they develop Arla Foods Code of Conduct and evaluate the company's position on a yearly basis with respect to their information gathered by the unit.

Lundén Pettersson has a suitable insight in Arla Foods business and has been identified as a key informant providing empirical data to this study from Arla Foods point of view.

4.2.1 Motivation

In Arla Foods code of conduct, they discuss, among other things, responsible sourcing and the environmental footprint their business generates. When discussing genetic engineering Arla Foods states that their products do not contain any DNA that has been genetically modified. Nevertheless, citric acid is an important ingredient when producing e.g. yoghurt. The citric acid is produced with genetic engineering but in the process, they separate the citric acid and thus there are no traces of GM DNA or protein from the citric acid left in the product. Thus, Arla Foods has no problem with the technique per se, as long as they can evaluate the consequences of its use. Herein is the problem of discussing GM in general and GM soybean especially. Arla Foods states that the technique can be used to develop a more efficient food production, e.g. higher protein content or to develop new varieties, which can be cultivated in other geographic areas than today. One of the largest motivations factors for Arla Foods to avoid GM soybean is that they recognise the disadvantages that the GM soy production encounter. For example, the heavy use of herbicide, the risk of that GM soy spreads into the wild and other, unknown, long-term effects on the environment. Arla Foods also sees risks when multinational enterprises control the seeds and varieties on the market, which forces the farmers to buy seeds from the companies holding patent that prohibit farmers from producing their own seeds at the farm.

4.2.2 Production

Arla Foods is a member of the Soy Dialogue in which they have a continuous dialogue between different actors in the Swedish food sector regarding questions about the use of soybeans in animal feed. As a result of the Soy Dialogue, Arla now demands that their member only uses RTRS certified soybeans in their production. Further, Arla also uses the Soy Dialogue to discuss the issue about GM or not GM soy with other actors on the market. Arla Foods view the Soy Dialogue as a tool to be equipped if a market change is about to occur. Arla Foods think that it is important that the entire industry is synchronised if such a major change in the market would occur. Since the future existence of GM-free soybeans is determined by the consumers' demand and it is a big change in how these questions are handled, Arla Foods believes that it is important that the industry have a collective standpoint.

Even if Arla Foods do not see a problem with the technique itself, they have some restrictions on the use of GM soybeans and Arla Foods handle the issue differently in countries where they operate. For example, while Arla Foods allows GM soybeans in animal feed in Denmark it is not allowed in Sweden. Even if it is difficult for Arla Foods to get a correct picture of the consumers' opinion, they try to follow it in different countries, which has resulted in their different positions on different markets. In the end, it is hard for Arla Foods to get the premium for GM-free soy covered in the Swedish market. The price difference between GM and non-GM soybeans is due to the higher production costs for farmers that produce non-GM soybeans and to distinguish the GM soybeans from GM-free soybeans in the supply chain. This premium results in a higher price for feed for the Swedish dairy farmers and thereby increases their production costs.

4.2.3 Consequences

Consumers demand non-GM products, but the majority are not willing to pay the extra price that it costs to provide GM-free products in Sweden. During times when Arla Foods owners have a rough economic situation, it gets difficult to continue their production and provide a high quality good when the producers do not get paid for the extra costs of the production needed to produce the product that the consumers demand. If consumers are not willing to pay the premium, there is a risk that the GM-free soybean products will not be produced in a long-term perspective. Arla Foods, which operates on a multinational market, experiences that Swedish consumers assign non-GM products attributes that does not reflect the production. When discussing social and environmental sustainability in a global context, little is distinguished between GM and non-GM soy production. In a global context, focus does not lie on whether the soybeans are GM or non-GM, but how the cultivation is managed and how social conditions are for the farmers. Arla Foods has decided that they should focus on sustainable production regardless of which technique that lies behind the varieties of soybeans. Even if Arla Foods recognises problems with GM soy production, e.g. glyphosate resistance and patent issues, they have major concerns with other issues connected to the soy production such as social conditions for the farmers and sustainable land use in South America. Therefore, Arla Foods has decided to buy a RTRS certificate for every tonne soybeans that their members (i.e. the farmers) purchase.

4.3 Lantmännen

Lantmännen is an agriculture cooperation owned by over 25 000 Swedish farmers from all over the country. Lantmännen is northern Europe's leading actor in agriculture, machinery, bioenergy and food. With a turnover above 37 billion Swedish kronor, over 10 000 employees and being present in 20 countries makes Lantmännen the largest actor in the Swedish agriculture sector. Lantmännens brand promise is "together we take responsibility from field to fork" at the same time as their mission is "to be the leading actors in northern Europe and create value throughout the whole grain value chain from field to fork".

In 2016 Lantmännen bought 120 000 tonnes of soy for animal feed. All of the soybeans is certified by RTRS or ProTerra, which is two different certifications for sustainable soybean production. Although none of these certifications says anything about GMO, all the soybeans purchased are non-GM. This, despite that Lantmännen recognises benefits of GM technique in order to develop crops, they have chosen to exclude GM soybeans from all their products including animal feed due to the current resistance of the purchasers. Gustav Kämpe, a sustainability project manager at Lantmännen, has a long experience in the GM soy discussion and was identified as a key informant for this study.

4.3.1 Motivation

Lantmännen has a positive approach towards the GM technique and thinks that it is a valuable innovation for the food development. Yet, they believe there are certain issues connected to the use and production of GM soybeans in animal feed. It is important that the consequences of the use are evaluated properly and that the eventual complications are known. Lantmännen states that the way GM soybeans are produced today is not done in a sustainable manner and that the technique could be used in a sufficient way. For example, the GM soy produced today is mostly beneficial for the farmers due to herbicide and pesticide resistance. Lantmännen

thinks that a GM product that will be beneficial for the consumers may possibly shift the consumers' resistance to a more positive opinion, e.g. products with higher nutritional value.

4.3.2 Production

Today, Lantmännen only use GM-free soybeans in their animal feed production since their customers' demands it. However, as the supply of GM-free soybeans decreases, and the premium that Lantmännen has to pay to get hold of GM-free soybeans decrease as well, they have identified a risk that they cannot provide their customers with GM-free products in the future.

Lantmännen is one of the members in the Soy Dialogue which they think have been a success due to that all food actors now use RTRS certified soybeans. Two of the main reasons that Lantmännen thinks that the Soy Dialogue was a successful collaboration was that it had a neutral impact on the competitiveness for the actors and that the members did not advocate for GM-free soybeans. When the Soy Dialogue were established, the GM debate was a well-discussed subject and the market was only interested in GM-free products from Swedish producers. Thus, if the issue of GM soybeans had been brought up, Lantmännen believes that if the feed industry had wanted GM soybeans, the food industry would probably have abandoned the Soy Dialogue. Consequently, the soybeans would not have been RTRS certified today. The feed industry, therefore, did not state any demands for the use of GM soybeans since they thought that it was more important to support a sustainable soy production, regardless the use of GMO or not.

4.3.3 Consequences

Even if Lantmännen sees a potential risk where they cannot satisfy their customers with GM-free animal feed in the future due to a scarcity of GM-free soybeans, they do not discuss the issue within the Soy Dialogue since they do not believe that they will get any attention from the actors in the food industry. Instead, the focus is to develop the Soy Dialogue into something that includes more crops and products to obtain a more sustainable food production.

The food industry has not shown any tendencies to abandon their position regarding the use of GM soybeans in animal feed. As Lantmännens' customers and owners have a slightly better economic situation compared to a year ago, due to better settlement in the dairy and meat sector, Lantmännen have a lower incitement to push the issue compared with the situation a couple of years ago.

Lantmännen notices that consumers' interest in the GM question is fairly low. Even if there exists a small part of the consumers that are well aware of the issue, the absolute majority have a low knowledge of the technique and its consequences. Thus, it is difficult to change the consumers' attitude when the issue is strongly connected with emotional beliefs and when consumers do not perceive scientific facts as objective. Kämpe believes that if a modern plant breeding technique would be used in Sweden in the future, the focus on technique should lie in benefiting the consumers and being introduced using another terminology.

4.4 HK Scan

In 1899, farmers in Halland got together and started the first slaughter cooperation in Sweden. During the 20th century, more farmers joined the cooperation and in 1970, approximately all slaughter cooperation's in Sweden were under the same brand: Scan. Scan was a member owned cooperation until 2007 when they consolidated to the Finnish HK Scan-Group. Today HK Scan markets their products, mainly products made from pork, beef, lamb and chicken, in 50 different countries although the main market is in Sweden, Denmark, Finland, and the Baltic countries. The revenue of 2014 was approximately 2 billion euros and HK Scan had approximately 7 700 employees.

Torbjörn Lithell is the Head Purchaser at HK Scan. Lithell is responsible for purchasing livestock for the slaughterhouses within HK Scan and thus have a close contact with livestock breeders. Further, Lithell used to work within the food retail sector and thus has a relevant insight in the context of this study.

4.4.1 Motivation

HK Scan has a neutral position in the issue regarding GMO. However, since they have demands from the food retail sector to only deliver meat from animals that does not have eaten GM crops they, in practice, only accepts meat from animals that have been fed with non-GM feed. This practice developed when the industry realised that there were almost 90-95 percent of the animals were fed with animal feed that did not contain GM soybeans. The food retail sector then thought that it was better that one hundred percent of the meat was produced GM-free feed to market the products as GM-free to the consumers. If the food retail sector would abandon the demand of GM-free production, HK Scan would let the individual producer of meat decide if he or she would like to use GM soybeans in their production.

4.4.2 Production

In contrast to the GM soybean issue, HK Scan took an early part of the process in the Soy Dialogue. HK scan views RTRS soybeans as an important part of their CSR work. However, HK Scan sees a problem with being forced to have both RTRS and GM-free soybeans as a demand on their producers. When being forced to handle both demands, the available amount of soybeans becomes even smaller. However, HK Scan cannot see that the consumers would turn away from their demand for GM-free soybeans in animal feed. HK scan tried to raise, throughout the Soy Dialogue, that if the sector had a thought of abandon the demand for GM-free soybeans it should happen when implementing RTRS as a substitute. Now the consumers are used to the benefit of both RTRS and GM-free soybeans. HK scan recognises that there might be problems with the production of GM soybeans but argues that there are even greater problems with soy production overall and that RTRS is a more efficient way of tackling these problems than just to forbid GM soybeans. If they were to choose between RTRS and GM-free soybeans, they would choose RTRS. They feel, however, a lack of support within the Soy Dialogue to discuss other issues, for instance the supply of GM-free soybeans and how the premium for the GM-free soybean develops. Further, HK Scan believes that it is contradictory when other actors who publicly claims that they do not demand GM-free soybeans when they, in negotiations with HK Scan, demands that the soybeans should be GM-free.

4.4.3 Consequences

An important aspect of the GM-free practice between producers and the food retail sector is that there are no legal obligations but a voluntary arrangement within the sector because of the consumers' fear of GMO in their food. A result of this is that the market can shift fast to adopt eventual changes of the consumers' preferences. However, Lithell emphasises that it is hard to really know about consumers' preferences due to that it is not possible for the consumers to make an active choice between meat from animals fed with GM feed or meat from animals that have not been fed GM feed. This also implies that the consumers only have access to one premium good on the market. As a result of only being able to buy GM-free meat, the consumers focus on the GM debate have declined over the past years. Today the focus of discussion lies within animal welfare and the use of antibiotics in the animal production.

From a producer's point of view, the position on GMO shifts depends on the profitability. Today the producers meet a high demand for Swedish meat and thus are able to pay the premium for GM-free soybeans. However, HK Scan sees a risk that if the margins decrease, the producers have a lower ability and incentive to provide the market with GM-free meat. In a scenario when the producers do not receive a price that covering the extra cost for GM-free soybeans their competitiveness decreases which can risk the entire sector, in a long-term perspective. In this scenario, the Swedish market will only contain meat from animals that have been fed with GM soybean regardless if the production is within the country or abroad, leaving the consumers with no choice of consuming GM-free meat. HK Scan, however, does not have the impression that the GMO debate among the consumers is that active today compared to a couple of years ago. They also have the impression that the average consumers have a low level of knowledge when it comes to GMO. Today the consumers focus more on sustainability, both from an ecological and a social perspective.

5 Analysis and Discussion

This chapter address the research questions stated in chapter one and discuss the findings of the study. The first section illustrates that GM soybeans can be viewed as a wicked problem. Then the empirical data is analysed with the ethical framework. The ethical framework was selected to help identify the commercial actors' standpoint since, according to Frewer *et al.* (1996), there is a desire among consumers to know that organisations act not only in a self-serving way. One of the research questions in this study is what the key informants' motive, action and consequences of their standpoint are. The ethical framework, developed in this study and presented in section 2.2.1 suggests that decisions are based on a motive and that decisions leads to actions that has consequences. It is therefore helpful for the analysis of this study to equate the theory of virtue ethics with the actors' motive, the theory of deontology with the actions, and the consequentialist theory with the consequences of their standpoint. The standpoint of the commercial actors may depend on the nature of the problem, therefor will the theory of wicked problem be used in order to determine the problems nature.

5.1 Wicked Problem

A wicked problem has an undefined mission and a high level of diversity and complexity (Rittel & Webber, 1973). Head and Alford (2015) presents certain criteria' which must be met in both diversity and complexity to be defined as a wicked problem. Waddock (2012) argues that globalisation and awareness of sustainability issues has led to the consequence that wicked problems are more common and even more complex. Head and Alford (2015) presents a chart for identifying if a problem is wicked or tamed. The chart is a schematic illustration and covers low complex issues were the problem, and the solution, is known and which only includes one party, but also high complex problems were neither the problem or the solution is known and were multiple parties is involved and have conflicting values and interest. Between the two extremes, there are different levels of complexity and diversity which determine how complicated the wicked problem is.

Diversity➔ / Complexity🡻	Single party	Multiple party each having only some of the relevant knowledge	Multiple parties, conflicting in value/interest
Both problem and solution known	Tame problem 1	2	3
Problem known, solution not known (relationship between cause and effect unclear)	4	5	Wicked problem GM soybeans in animal feed
Neither problem nor solution known	7	Wicked problem 8	Very wicked problem 9

Figure 9. *The phenomena in this study's placement in Head and Alford (2015) matrix.*

In the case of GM soybeans in animal feed in Sweden, the problem is defined as a wicked problem but with different complication level since the complexity varies among the key informants. Some key informants do recognise that GM soybeans in animal feed are a problem while other key informants do not view this as a problem at all. None of the key informants has a solution to the problem, and there are multiple parties with a conflicting interest in the issue regarding GM soybeans in animal feed. This circumstance turns the issue into a wicked problem according to Heads and Alfords (2015) criteria's which is illustrated in Figure 9. To make the problem even more complex, it should be clear that there are multiple actors e.g. researchers, policymakers and consumers that affect the development of GM soybeans even if these actors are not a part of this study. This study contributes to the knowledge of GM soybeans as a wicked problem by investigating the perspective of commercial actors since these actors have received little attention in the academic literature earlier.

5.2 Analytical Discussion based on the Ethical Framework

The key informants in this study are all aware that commercial actors have a conflicting interest in the issue although the level of complexity may vary. Lantmännen has identified a strategic risk that they may no longer be able to provide the Swedish market with GM-free soybeans due to decreasing production and thus supply on the world market. However, they do not know how to solve this issue if the market in Sweden still only demands GM-free soybeans in the future. The same applies to HK Scan. They are aware of that their producers are going to have problems to produce meat and only using GM-free soybeans in their feed. However, while Arla has taken a stand for not using GM products, HK Scan states that they have a neutral position. The statement makes it easier for HK Scan to allow their producers to use GM soybeans in the production. Arla recognises that it can be a problem in the future but states that they do not want to use soybeans in their Swedish products. However, they do not have any solution if their members and farmers cannot get hold of GM-free soybeans. ICA sees no obstacles to launching products from animals that has been fed GM soybeans and therefore do not recognise the problem of an eventual scarcity of GM-free soybeans. The key informants' different views make it more difficult to reach an agreement than if they would have shared the same view.

The empirics in this study show that the key informants have different views on the wicked problem and thereby confirm the complexity of the problem. Despite that it exists a multi-stakeholder network were the key informants has a forum for discussing the issue of GM soybeans, they have different perspective and understanding of the issue. Three of the key informants recognise that there is a complex problem where they cannot see a solution. They feel that other commercial actors do not understand their situation and perspective. For example, they cannot distinguish a premium to cover the extra costs that derive from the use of GM-free soybeans. Further, the key informants' states that the issue is discussed with various frequencies in correlation with the economic situation for the producers and farmers. When the financial situation on farm level is adequate, the incentive is low to lobbying for the use of GM soybeans and thereby risk the consumers' trust in Swedish products. The other key informant does not recognise the problem or why GM soybeans are not used in animal feed in Sweden. However, ICA does have demands that their suppliers should have a particular quality of their products and that they have a third-party certification to ensure this quality. Thus, they do not recognise the absence of GMO as a quality aspect. Instead, all the key informants agree that the soy production needs to be cultivated in a more sustainable way and believes that this is more important than the use GM technique due to that the technique can

be a valuable tool in the future to ensure a sufficient global supply of food. Thus, they have a consequentialistic approach where they believe that the focus should be on the consequences (i.e. the crops abilities) of the technique, rather than the technique itself. The different approaches of the key informants will be analysed in the following part.

As mention earlier in this study, commercial actors' perspective of GM soybeans has been omitted from the academic literature. Having identified GM soybeans as a wicked problem, this study uses an ethical framework to investigate the perspective of commercial actors. Table 3 shows the ethical perspectives of the commercial actors' perspective. This logic is based on that motives give the incentive to perform different actions and these actions can have different consequences. When investigating the ethics of perspectives, different conclusions can be drawn depending on from what approach that is in focus. For example, for some organisations, the consequences are most important, and they, therefore, chooses to act in a certain way and after that explain their motive, while other organisations may instead have a clear motive on how they act and thereafter view the consequences of the action. In this study, all the commercial actors have independently made a standpoint to not use GM soybeans in animal feed in the Swedish market even though there is no legislation or formal hinders for them to use GM soybeans. Therefor it is the logic that underpins the decision not to use GM soybeans in animal feed that is investigated in this study. The key informants' different standpoint will be analysed and discussed in this chapter.

Table 3. *A summarised overview of the key informants' perspective divided under the different analytical themes.*

Analytic themes	Ica	Arla	Lantmännen	HK Scan
Virtue ethics - motive	Positive towards GMO	Both positive and negative towards GMO	Positive towards the technique.	Neither positive or negative
Deontology - actions	Prefers RTRS over GM/non-GM	Different statements in different countries.	Must get hold of GM-free soybeans	Let every producer self-decide
Consequentialism - outcome	Do not purchase Swedish GM products. But foreign products	In Sweden- RTRS and non-GM soybeans	Only purchase GM-free soybeans.	No GM soybeans in Sweden

5.2.1 Motive

Virtue ethics is the motive of an act focuses on the character of the decision maker (Gregorowius *et al.*, 2012). Virtue ethics distinguishes from deontology and consequentialism. Thus, it is not on the actor himself that the focus lies, but his or her character traits. In this study, the different key informant has had various reasons and logics behind their decisions. Even if all the key informants except HK Scan says that they are positive towards the GM technique, they have different reasons for their standpoint. ICA believes that the GM soybeans are not in the interest of their consumers who chooses to buy Swedish animal products and thereby not for ICA either. Arla follows the same logic in their Swedish products, which all have been produced with GM-free soybeans. However, they sell products in Sweden with other origins than Swedish that is products with GM soybeans. Lantmännen wants to provide the Swedish market with GM-free soybeans as long as the market demands it but sees a risk that they will not be able to do so in the future due to

decreasing supply of GM-free soybeans. Lantmännen believes that the use of GM soybeans is not sustainable today, but their motive is more driven by market demand than by an ethical standpoint. HK Scan has a neutral approach to the problem where they can adapt to a shift of the market demand. Thus, the different reasoning and logics behind the key informants' motive shows the nature of the problems complexity.

In the context of GM soybeans, it is a moral issue if humans should intervene in other organisms' DNA and change the DNA construction in a way that cannot occur naturally (McFadden & Lusk, 2016; Frewer *et al.*, 2013). This moral issue can be applied to the concept of virtue ethics. In Table 4, the key informants' perspective from a virtue ethic point of view is summarised.

Table 4. *The key informants' perspective from a virtue ethics point of view.*

Analytic theme	Ica	Arla	Lantmännen	HK Scan
Virtue ethics - motive	Positive towards GMO but it should be a responsible production and provide benefits to their consumers.	Both positive and negative towards GMO - depends on its use. The consumer has to decide.	Provide a sustainable product. Contribute to a sustainable feed/society. Positive towards the technique but sees problems with use of GMO today. Provide what is demanded by the market.	Have a neutral position and provide what their customers' demands.

The key informants do not take a standpoint in the perspective of virtue ethics since they do not reject GM soybeans due to moral reasons. However, some key informants discuss that some of their consumer groups value this moral issue, but states that the groups have a low market power. The key informants stress that a sustainable soybean production is more important than GM-free soybeans.

5.2.2 Action

While virtue is about the motive and logic that lies behind an act, deontology is the act itself and the underlying principles (Boatright, 2009; García-Rosell & Moisander, 2007; DesJardins, 1997). In other words, which acts does the logic and reasoning lead too. The key informants have different standpoints from a virtue ethics point of view and they have different ways to handle some issues. All the key informants have a positive or neutral attitude towards the technique as such. Table 5 summarises the key informants' perspective from a deontological point of view. ICA highlights the importance of sustainable production but have no demand on their suppliers to produce products without GM soybeans. Arla uses the GM technique when producing some product e.g. yoghurt (citric acid) but thinks at the same time that the GM-free production in Sweden is important due to consumers demands. According to Arla, the profitability at the farm level is high enough to cover the extra costs of purchasing GM-free soybeans, which means that the incentive for Arla to push the question now is low. However, one can discuss the awareness of the use of GM technique among consumers in the preparation of the citric acid. Lantmännen works to continue developing their supply chain to ensure a sufficient supply of GM-free soybeans in the future. They also

act to push similar incentive as the Soy Dialogue to other crops. HK Scan lets every producer and purchaser decide for themselves on how to handle to GM soybeans if a change in the demand of the market would occur.

Deontology means that individuals act on principles rather than on their consequences of their action (Boatright, 2009; García-Rosell & Moisander, 2007; DesJardins, 1997). It also implies that humans have a moral duty to protect the environment regardless if the act do not have any welfare benefits (DesJardins, 1997). The key informants do not have a deontological perspective since they welcome the technology per se but thinks that the consequences of the technique today are not beneficial to the society. However, with a longer time perspective, the key informants believe that GM soybeans could have a place in the Swedish market. Although, if this should happen the focus in research must shift to develop soybeans that contribute to the society. For example, to produce more per hectare, have higher nutritional content, and need less irrigation.

Table 5. *The key informants' perspective from a deontological point of view.*

Analytic theme	Ica	Arla	Lantmännen	HK Scan
Deontology - actions	Promote a sustainable soy production, prefers RTRS to GM or non-GM soybeans.	Different statements and thus actions in different countries. Must evaluate the consequences of the use.	Implement the concept of RTRS in additional crops. Must get hold of GM-free soybeans.	Let every producer and purchaser decide for them self. If the food industry would accept GM soybeans, HK Scan will provide this.

All of the actors in this study is a part of a multi-stakeholder network The Soy Dialogue. In other words, the four cases have taken an active stand (an action) to be a part of The Soy dialogue. The Soy Dialogue is a network where actors work together to support a sustainable production of soybeans. The actors within the Dialogue have committed themselves only to use RTRS certified soybeans in their assortment. The collaboration can be viewed as an act to manage the problem. However, the Soy Dialogue have not covered the use of GM soybeans. Roberts (2000) suggest that a stakeholder approach is suitable when implementing a collaborative strategy to deal with a wicked problem. In this study, the wicked problem is identified as the use of GM soybeans in animal feed. Svendsen and Laberge (2005) argued that a stakeholder network is useful when companies deal with complex sustainability and corporate responsibility issues. Several of the key informants emphasises that the Soy Dialogue has worked well and that it can be used to raise the question about the use of GM soybeans in animal feed. However, it seems that the key informants have prejudices about what opinions other actors have on the issue regarding GM soybeans in animal feed. These prejudices may be the result of that the network is not as active today due to that all the actors use certified soybeans in their assortment.

The three different strategies proposed by Roberts (2000) can handle the wicked problem. The *authoritative strategy* means that a few but powerful stakeholder decides to define the problem and a solution. If an *authoritative strategy* would be applied in this study, Arla and ICA could be viewed as powerful stakeholders, due to their market share, and could, therefore, determine the solutions. However, this is not a likely scenario since they do not share the same view of the problems complexity. If the *competitive strategy* was used in this

study, a single stakeholder would take the first step and introduce products containing GM soybeans in their assortment. Since none of the commercial actors in this study has the willingness to introduce a product containing GM soybeans the *competitive strategy* is unlikely to be used for solving this wicked problem. The final strategy by Roberts (2000), the *collaborative strategy,* focus on a collective solution process that includes all stakeholders. When implementing the collaborative strategy, the stakeholder theory and multi-stakeholder network theory is appropriate both in terms of identifying stakeholder but also to get an understanding of the different stakeholders' perspective and how they may differ. When dealing with complex issues, it is important to have an understanding of other actors' perspectives and understand their premises. A prerequisite for obtaining an understanding of the other actors' perspective is a collaboration (Roloff, 2008a; Roloff, 2008b; Calton & Payne, 2003). Svendsen and Laberge (2005) provide a framework of a network-focused system view. Figure 10 illustrates the commercial actors' multi-stakeholder network with regard to GM soybeans in animal feed. As Figure 10 shows, all the commercial actors interact with each other and thus creates a network-focused, stakeholder engagement. However, the level of interaction between the different commercial actors differ. Lantmännen and Arla Foods are driving the issue and see the problems, while ICA and HK Scan do not view the issue as problematic as Lantmännen and Arla Foods. Even if the multi-stakeholder network already is established, the actors do not seem to get a nuanced picture of each other's perspective. Roloff (2008b) argues that in a multi-stakeholder network it is important that none of the actors has total control and that there exists some level of dependence and trust in the relation. This failure to get all commercial actors to unite in a collective perspective could be derived from a low level of trust or that there is a skewness in the distribution of power among the actors. For example, Arla is considered to have a large influence on the feed market and their decision for using GM-free soybeans affect the rest of the commercial actors. Thus, according to Roloff (2008b), a multi-stakeholder network is not sufficient for solving the wicked problem since the power distribution is not equally dispersed.

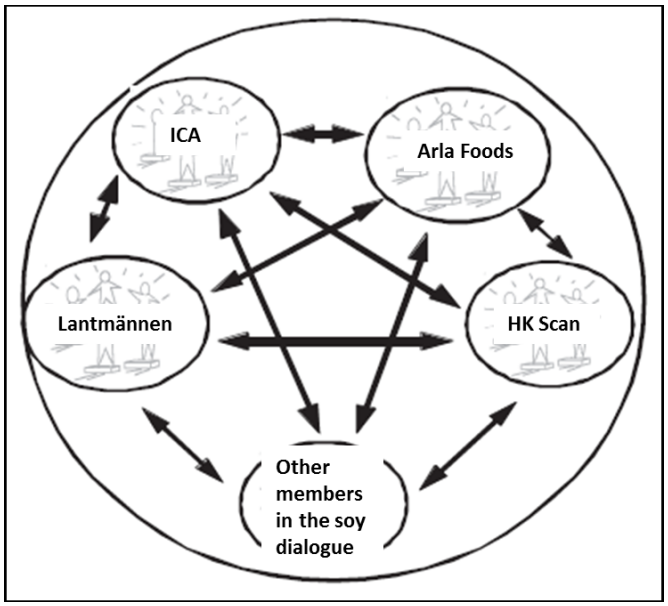

Figure 10. *The multi-stakeholder network based on the key informants in this study, based on Svendsen and Laberge (2005).*

Some actors believe that there will be a change in consumers demand in the future and that it is important that the whole industry is synchronised when this significant change occur on the market. It is therefore crucial with a collective standpoint among the commercial actors. However, as long as that the skewness in power distribution remains it will be hard to reach a collective standpoint. Without this collective standpoint, it will be difficult to develop a strategy to deal with the problem, and the multi-stakeholder network will just be used as a forum for discussion about perspective rather than focus on an agreement of how to handle the problem. The reason that the multi-stakeholder network was successful when dealing with sustainable soy was that the entire industry thought that it was an important issue that needed to be managed. The different standpoints imply that the commercial actors view sustainable soybeans as a more central issue than the problem of GM soybean in animal feed.

It can be discussed if the stakeholder theory is sufficient to handle high complex problems. In this study, the stakeholder theory has mainly been used to describe an existing multi-stakeholder network that dealt with sustainable soy production. When incorporating an environmental ethics framework, such as virtue ethics and the motive for not handling GM soybeans, it disposes of differences in the key informants' view. This different perspective within the stakeholder network makes it difficult for the members to come up with an agreement on how to handle the problem of GM soybeans in animal feed. In this study, stakeholder theory has been used to identify and analyse the existing multi-stakeholder network and how the key informants handle and discuss the issue.

5.2.3 Consequences

DesJardins (1997) discuss that an ethical approach is central when discussing controversies in environmental problems. Further, it is important that humans are more aware of the way they think and acts when confronted with environmental issues. The key informants recognise the importance of an awareness of environmental issues such as the use of GMO in animal feed. In Table 6, there is an overview of the key informants' perspective from a consequentialistic point of view. The key informants take a consequentialist standpoint since they are not against the technique as such but think that negative consequences surpass the advantage of the technique. For example, glyphosate-resistant GM soybeans that do not contribute to an increased welfare in society since the use, in the long term, forces an expanded use of herbicides in the production. In other words, the key informants are aware of the issue, and they have decided that they will not use this product (GM soybeans) because of the negative consequences of the product today. According to García-Rosell and Moisander (2007), the satisfaction and pleasure for human beings are the primarily focus in a consequentialist theory. In a utilitarianistic and consequentialistic approach, the goal is to maximise the overall good. However, with the use of GM soybeans, the key informants believe that the use today is more focused to generate short-term profits within large multinational corporations instead of contributing to a more sustainable production.

Table 6. *The key informants' perspective from a consequentialistic point of view.*

Analytic theme	Ica	Arla	Lantmännen	HK Scan
Consequentialism - outcome	Quality assurance do not purchase Swedish GM products. But foreign products	In Sweden RTRS and non- GM soybeans	Only purchase GM-free soybeans. If GM it must be RTRS	No GM soybeans in Sweden

The key informants cannot avoid bringing up consumers as an important part of the value chain. All of the key informants emphasise that the average consumer, in general, has little knowledge of GM soybeans in animal feed. Thus, it can be argued that it is hard for consumers to evaluate the consequences of their actions if they have little knowledge in the field. In a utilitarianistic approach, would mean that as long as people get what they desire, they are satisfied and as long as the greatest number of human beings are satisfied, an act is morally right. However, if the general consumer is unaware of the issue, it will not be the majority of consumers that determines the condition for an introduction of GM soybeans in the Swedish animal feed market. Instead, the consumers that have the strongest opinion about the technique will shape the public discussion. The key informants' experience that it is a few number of consumers that is concerned about the issue and that these few consumers affect the future existence of GM soybeans in the Swedish Feed market.

5.3 Key Insights

The literature review shows that the research community cannot agree upon whether GM crops are beneficial or unfavourable. This study provides an input to this ongoing debate. Many studies in social sciences on GM crops focus on consumers and primary producers and thus omits other commercial actors in the value chain (McFadden & Lusk, 2016; Ribeiro *et al.*, 2016; Ceccoli & Hixon, 2012; Costa-Font *et al.*, 2008; Carlsson *et al.*, 2007; Magnusson & Hursti, 2002). This study finds that the issue is complex and thereby it is difficult for an actor to take a clear standpoint for, or against, the use of GM soybeans in animal feed. In the literature review, seven different factors affecting consumers' attitudes towards GM crops were identified. Among these seven factors, only two were primarily discussed by the key informants: environmental and moral perspective. The key informants, like most consumers, finds that there are threats to the environment connected to the use of GM soybeans today. These threats include environmental concerns regarding the production but also social sustainability for the farmers that produce the soybeans. However, the reasoning behind the logic and reasoning differs. While consumers connect the environmental and social problem to GMO only, this study on commercial actors shows that some of these problems are not related to GM or non-GM. The cases in this study see both benefits and threats with the use of GM soybeans. For instance, the key informants state that if a GM soybean were to be developed that focus on the end product, e.g. with higher nutritional content, and not only concentrate on the production, e.g. pesticide resistance, they would promote such development. The second factor, moral perspective, also differs between the consumers' and the key informants' reasoning. Consumers often have a moral concern with the use (Frewer *et al.*, 2013; Frewer, 2003; Magnusson & Hursti, 2002). Some consumers state that humans should not play God and intervene with other organisms' DNA (Frewer *et al.*, 2013). The cases do not discuss this moral concern of the technique in this way at all. Instead, they have other ethical standpoints, which are analysed in the light of this study's theoretical framework. However, there are some similarities and differences among the informants' perspectives, which are summarised in Table 7. There exist several similarities among the commercial actors, which mainly depends on an earlier agreement not to use GM soybeans in animal feed. Despite some differences and similarities, there are factors under the three perspectives that are the same for all the cases. Even if the cases have different views of customers' focus and ideas, the common denominator under the virtue perspective is just that it is the customer that are in focus. When discussing the deontology perspective, the production is in focus for the firms. In the consequentialistic perspective, the purchasing context is the common denominator at the firms.

Table 7. *The similarities and differences in the key informants' perspectives.*

Analytic themes	Similarities	Differences
Virtue ethics - motive	No actor purchases GM soybeans in Sweden. Customer context	ICA and Arla focus on the consumers' demand. Lantmännen and HK Scan focus on the Swedish farmers.
Deontology - actions	All actors promote a sustainable soy production. Production context.	Organisation structure makes their flexibility vary.
Consequentialism - outcome	Only purchase RTRS certified soybeans. Purchasing context	Arla and ICA: GM soybeans may occur within the corporation due to production abroad and imported products.

The underlying reason for the actors not purchasing any GM soybeans on the Swedish market vary. ICA and Arla tend to take the consumers attitudes in for consideration and are concerned about eventual reactions from the consumers if they should promote a Swedish GM product in their assortment. Lantmännen and HK Scan, on the other hand, focus more on the primary producer, i.e. the Swedish farmers. With a flexible organisation structure, both ICA and HK Scan can provide individual solutions for both producers and consumers in a way that is not possible for Arla and Lantmännen. Due to production systems, they cannot handle both GM and non-GM soybeans and thus have to choose one way or the other, i.e. they can only provide the market with one of the two goods. While Lantmännen's and HK Scan's core business is limited to a Swedish context and they do not face the complexity of meeting different markets with an acceptance for GM products, which Arla does. In other countries, Arla accepts GM soybeans in animal feed. However, this is not accounted for in this study. ICA are aware that some imported animal products may have been produced with feed containing GM soybeans but does not view this as a problem. Thus, there exists both similarities and differences in the perspective of GM soybeans at the four cases.

Some of the key informants seem to find some perspective more important than others, were for example, some of the informants takes a stand from a virtue ethic point of view, and some have a consequentialistic approach. The issue of GM soybeans is, therefore, more complex compared to the Soy Dialogue. In the Soy Dialogue, all the commercial actors had similar views and aimed to reach a joint position, but on the issue of GM soybeans, the commercial actors do not share the same visions and views. Even if a collaborative strategy were to be used on the issue of GM soybeans, the same success as the Soy Dialogue could probably not be expected due to the differences in views on the issue. When implementing a multi-stakeholder network, it is important that actors within the network have a complementary approach to the issue and that the actors are working for the same solution for the issue (Roloff, 2008a). The lack of solutions and progress within the commercial actors may be a result of that the different actors do not share the same perspective. Roloff (2008b) highlights the importance that none of the actors has total control and that it must exist some level of dependence and trust in the relationship among stakeholders in order the be successful in implementing a multi-stakeholder network. Roberts (2000) argues that when trying to solve a wicked problem, three different strategies are suitable depending on if the power is dispersed or if the power is contested. In this case, Arla seems to have more power in the issue since

they represent a significant number of farmers and is therefore indirectly the biggest purchaser of GM-free soybeans for animal feed in Sweden. Since the power is not equally shared among the commercial actors and since the power is not dispersed, a collaborative strategy is not likely to be efficient to solve this wicked problem. Roloff (2008b) argumentation about the importance of control when implementing a multi-stakeholder network would, in this case, mean that if Arla has more power regarding the issue, compared to the other actors, the stakeholder theory would not be a suitable theory when searching for a solution to the wicked problem. This power distribution follows Roberts' (2000) argumentation (see Figure 2) about that if the power is dispersed an authoritative strategy is preferred to handle the wicked problem and not a collaborative. In the context of GM soybeans in Swedish animal feed, this means that a commercial actor with a high-level power, relatively towards the other actors, would determine if an introduction of GM soybeans will occur in the future in Sweden.

Regarding the use of GM soybeans in animal feed in Sweden, there are both similarities and differences between the informants' views. All the informants state that their organisations promote a sustainable soy production. However, Arla has an active standpoint for not using GM soybeans in Swedish production while the others have a more positive attitude towards the use, as long as it is produced in a sustainable way. In Table 8, the reader finds a summary of the previously presented views of the key informant. The key informants have different logics behind their reasoning and therefore have different views towards the issue.

Table 8. *The different key informants' perspective from the analytical themes. An assembly of table 4, 5 and 6.*

Analytic themes	Ica	Arla	Lantmännen	HK Scan
Motive *Virtue ethics* Customer context	Positive towards GMO but it should be a responsible production and provide benefits to their consumers.	Both positive and negative towards GMO - depends on its use. The consumer has to decide.	Provide a sustainable product. Contribute to a sustainable feed/society. Positive towards the technique but sees problems with use of GMO today. Provide what is demanded by the market.	Have a neutral position and provide what their customers' demands.
Actions *Deontology* Production context	Promote a sustainable soy production, prefers RTRS to GM or non-GM soybeans.	Different statements and thus actions in different countries. Must evaluate the consequences of the use.	Implement the concept of RTRS in additional crops. Must get hold of GM-free soybeans.	Let every producer and purchaser decide for them self. If the food industry would accept GM soybeans, HK Scan will provide this.
Consequences *Consequentialism* Purchasing context	Quality assurance do not purchase Swedish GM products. But foreign products	In Sweden RTRS and non- GM soybeans	Only purchase GM-free soybeans. If GM it must be RTRS	No GM soybeans in Sweden

The different logics results in different views of the wicked problem. However, the similarities these four cases shows is that the firms take on the same eyes when presenting their perspective. Even if the focus and ideas behind differs, all the firms took a customer context approach when discussing virtue ethics. While the deontology perspective instead had a focus at the cases production context. At the same way, the consequentialistic perspective had a purchasing context. It is important to emphasise that this study does not seek to value their different standpoints but instead to present a nuanced picture of how different commercial actors view the issue of GM soybeans in Swedish animal feed market.

6 Conclusions

This final chapter will address the aim of this study. Further, the contributions and limits of the study will be provided. At the end of this chapter, suggestions for further research within the field will be presented.

6.1 Key findings and contributions

The aim of this study is to investigate commercial actors' ethical perspective of the use of GM soybeans in the Swedish animal feed market. An ethical framework was developed to investigate the perspective of commercial actors' use of GM soybeans in the Swedish animal feed market. The study has found that the commercial actors have a different perspective regarding the issue of GM soybeans in animal feed in Sweden. While some actors have a neutral position towards GM soybeans, i.e. they do not have an opinion whether their products is produced with GM or non-GM soybeans, others have a clear position that they do not want GM soybeans in their assortment. At the same time, all the actors have a positive view of the technique as such but are restrictive of the use today. This, since they recognise some of the drawbacks with the use of GM soybeans today, consumers have a negative attitude towards GM soybeans and most GM crops only benefits the corporations that produce them. If the development of GM crops also has a focus on benefiting the consumers as well, for example higher nutritional content, the actors' opinion might shift. However, the key informants have argued that there is still an underlying resistance against the technique among some consumers because the technology manipulates the genes.

This study contributes to a better knowledge and a deeper understanding of commercial actors' ethical perspective by presenting a nuanced picture of how different commercial actors view the issue of GM soybeans in the context of animal feed in Sweden. The commercial actors have different perspectives on the use of GM soybeans even though they might share some standpoints of not using GM soybeans in animal feed they have different logics underpinning their decision to not use GM soybeans. Thus, there is not a collective standpoint from a virtue ethic perspective. However, it seems that all the four cases tend to think of the consumers ideas when applying a virtue perspective on the issue. From a deontological perspective, the actions differ, but the interesting part with the deontological perspective is that it seems to be connected to the different production context of the cases. Depending on the flexibility in the production lines, different actions are undertaken. From the consequentialistic approach, all the actors believe that the evaluation of a product should be based on the final product, not in the method used in developing it. In other words, the consequentialistic perspective is shown in the context of purchasing. The consequences of producing a GM or non-GM crop should always be evaluated, and thus the key informants have a consequentialist approach.

This study suggests that the different cases use different perspective when dealing with the wicked problem of GM soybeans in animal feed. Firms tend to show different ethical perspective when dealing with a wicked problem. This provides input to how wicked problems is viewed and how an ethical perspective can be used. However, this study has limitations. The context of this study was undertaken at a particular time and place, which affects the results. The key informants mean that their incentive to lift the debate regarding GM soybeans varies with regard to the economic concerns of using GM-free soybeans. Although the GM debate is to some extent dormant today, the issue is discussed internally

according to some key informants. In addition, this study was made by interviewing a limited number of commercial actors within the context of GM soybeans in Sweden and the Soy Dialogue. Thus, the result cannot be generalised statistically which could decrease the transferability, although according to Yin (2009) and Robson (2011), it is possible to draw an analytic generalisation which could give some helpful understandings in other contexts. Bryman (2011), however, argues that qualitative finding could be used to generalize theory rather than populations. When conducting a comparative case study, it is not an aim to generalize the cases or their perspective. However, it could be interesting to investigate if this study's result, that firms shows different ethical perspectives when dealing with a wicked problem, is useable in other contexts as well.

6.2 Further Research

This study suggests that firms show different ethical perspectives when dealing with a wicked problem. Since this study uses a qualitative method, comparative case study, it could be interesting to investigate if the same results would be the same if the context were another.

Both in the literature review and in the interviews with the key informants, consumers' negative attitudes are discussed. It seems that many consumers wonder what benefits they get from purchasing GM products and that they have a moral doubt which purchasing GM products. Therefore, a proposal for future research is to investigate how consumers' ethical doubt effects if they are given the possibility to purchase a GM product that has clear benefits for themselves.

This study also implies that Arla may possess a significant market power in the issue regarding GM soybeans in animal feed in Sweden. As an indirect purchaser of soybeans for animal feed in Sweden and as the largest dairy company, their standpoint becomes essential for the other commercial actors to relate to. In further research, it could be useful to investigate Arla with the concept of monopsony. Monopsony is a condition in a market where there are only one customer and many sellers. Even if Arla is not the only customer, maybe the theory is useful to apply when an actor has a dominant position in a market.

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Appendix 1 Who is a Stakeholder? A Chronology

Who Is a Stakeholder? A Chronology

Source	Stake
Stanford memo, 1963	"those groups without whose support the organization would cease to exist" (cited in Freeman & Reed, 1983, and Freeman, 1984)
Rhenman, 1964	"are depending on the firm in order to achieve their personal goals and on whom the firm is depending for its existence" (cited in Näsi, 1995)
Ahlstedt & Jahnukainen, 1971	"driven by their own interests and goals are participants in a firm, and thus depending on it and whom for its sake the firm is depending" (cited in Näsi, 1995)
Freeman & Reed, 1983: 91	Wide: "can affect the achievement of an organization's objectives or who is affected by the achievement of an organization's objectives" Narrow: "on which the organization is dependent for its continued survival"
Freeman, 1984: 46	"can affect or is affected by the achievement of the organization's objectives"
Freeman & Gilbert, 1987: 397	"can affect or is affected by a business"
Cornell & Shapiro, 1987: 5	"claimants" who have "contracts"
Evan & Freeman, 1988: 75–76	"have a stake in or claim on the firm"
Evan & Freeman, 1988: 79	"benefit from or are harmed by, and whose rights are violated or respected by, corporate actions"
Bowie, 1988: 112, n. 2	"without whose support the organization would cease to exist"
Alkhafaji, 1989: 36	"groups to whom the corporation is responsible"
Carroll, 1989: 57	"asserts to have one or more of these kinds of stakes"—"ranging from an interest to a right (legal or moral) to ownership or legal title to the company's assets or property"
Freeman & Evan, 1990	contract holders
Thompson et al., 1991: 209	in "relationship with an organization"
Savage et al., 1991: 61	"have an interest in the actions of an organization and . . . the ability to influence it"
Hill & Jones, 1992: 133	"constituents who have a legitimate claim on the firm . . . established through the existence of an exchange relationship" who supply "the firm with critical resources (contributions) and in exchange each expects its interests to be satisfied (by inducements)"
Brenner, 1993: 205	"having some legitimate, non-trivial relationship with an organization [such as] exchange transactions, action impacts, and moral responsibilities"
Carroll, 1993: 60	"asserts to have one or more of the kinds of stakes in business"—may be affected or affect . . .
Freeman, 1994: 415	participants in "the human process of joint value creation"
Wicks et al., 1994: 483	"interact with and give meaning and definition to the corporation"
Langtry, 1994: 433	the firm is significantly responsible for their well-being, or they hold a moral or legal claim on the firm
Starik, 1994: 90	"can and are making their actual stakes known"—"are or might be influenced by, or are or potentially are influencers of, some organization"
Clarkson, 1994: 5	"bear some form of risk as a result of having invested some form of capital, human or financial, something of value, in a firm" or "are placed at risk as a result of a firm's activities"
Clarkson, 1995: 106	"have, or claim, ownership, rights, or interests in a corporation and its activities"
Näsi, 1995: 19	"interact with the firm and thus make its operation possible"
Brenner, 1995: 76, n. 1	"are or which could impact or be impacted by the firm/organization"
Donaldson & Preston, 1995: 85	"persons or groups with legitimate interests in procedural and/or substantive aspects of corporate activity"

(Mitchell *et al.*, 1997, p. 858)

Appendix 2 Members in the Soy Dialogue and Sampling Criteria's

Companies \ Criterias	Member of the Swedish Soy Dialogue	Purchase soybeans (or products from animals that has been feed with GM soybeans	Sustainability Report	Belong to a concern with operations in an international context with focus in Sweden
Arla	x	x	x	x
Axfood	x	x	x	
Bjärefågel	x	x		
Coop	x	x	x	
Dafgårds	x	x		
Dalsjöfors kött	x	x		
Ginsten Slakteri	x	x		
Gotlands Slakteri	x	x		
Guldfågeln	x	x		
Gäsne Mejerförening	x	x		
HKScan Sweden	x	x	x	x
ICA	x	x	x	x
Ingelska Kalkon	x	x		
KLS Ugglarps	x	x		
Knäreds Kyckling	x	x		
Kronfågel	x	x		
Lagerbergs	x	x		
Lantmännen	x	x	x	x
Martin & Servera	x	x		
Norvida	x	x		
Nyhléns Hugosons Chark	x	x		
Skånemejerier	x	x	x	
Sköve Slakteri	x	x		
Svenskt Butikskött	x			
Svensk Fågel	x			
Svenska Ägg	x			
Svenskt Kött	x			
Föreningen Foder & Spannmål	x			
Lantbrukarnas Riksförbund	x			
Svenska Köttföretagen	x			
Sveriges Nötköttsproducenter	x			

Appendix 3 Interview Guide

- Tell us a little bit about your company and your own role within the organisation
- What is GMO to you?
- How do you keep your company updated on the technique?
- What are your company's' view upon GM soybeans?
- Tell us about your company's' view upon GM crops from an ideological perspective.
- How do your company keep yourself updates on the innovations process regarding GMO?
- What are the biggest challenges regarding to GM soybeans? Economically, environmentally and socially?
- Do you have any collaboration with other actors? Both within and outside the industry?
- Which benefits and challenges occur when you work together with other actors?
- Does problem occur when different actors in the value chain have different views on the problem?
- Which other actors do you communicate with regarding to GM soybeans?
- How do you discuss these issues with other actors in the supply chain?
- How does the attitude vary within the company?
- What is your view and how do you manage the problem that some consumers do not want to pay the non-GM premium?
- How do you keep yourself updated on consumers will?
- Do the consumers know that animal products from other countries are from a process involving GM soybeans?
- What will be your view in five years? In ten years?
- If you were to know that almost no non-GM soybeans were able to harvest due to heavy rains in Brazil, how would you act? Would it be okay with GM soybeans for a period in Swedish animal products?
- What is the premium limit for non-GM soybeans?
- What would have to happen for your company to change opinion?