# How is triple bottom line thinking included in small-firm decision making?

– A study of potato farmers in Östergötland, Sweden

*Hur påverkas potatisproduktionen av kvalitetskrav?*

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# How is the primary production of potatoes affected by quality requirements? – A study of primary production in Östergötland, Sweden

*Hur påverkas potatisproduktionen av kvalitetskrav – En studie i den primärproduktionen i Östergötland, Sverige*

Madeleine Gillheimer

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# Abstract

Earlier research has shown a lack of studies on waste in agriculture production. Therefore, there is a need for improved screening for the cause of wastage in primary production. In addition, more research is required on how quality requirements and norms affect wastage and how waste can be prevented. Food is lost or wasted through the supply chain; the waste appears from the primary production to the end consumer.

The waste in the food chain creates financial losses and unnecessary environmental impacts on how the food chain is structured today. The waste in primary production creates also negative outcomes for producers' finances, cultivatable land, and the climate.

This thesis aims to develop an understanding of how triple bottom line thinking is included in management decisions in small businesses. The thesis should explain why wastage occur in the primary production at potato farmers and how the quality norms affect the primary sector of the losses and waste. Decision-theory and Triple bottom line theories should review a potato producer's decisions because of the quality requirement from an economic, social, and environmental value perspective. Two farmers have been interviewed and contributed their perspectives on the prevailing requirements by researching the quality norms in the primary production of the potato sector. The respondents have provided perspective on how they connect economic, social, and environmental values in their decisions.

This research has answered the research questions with the help of a qualitative research strategy. Qualitative research enables in-depth contextual understanding and closeness to the respondents who are involved. Therefore, in order to answer the research questions and to provide a deeper understanding of the farmer's connection to TBL, a case study method was selected.

Food potatoes that do not meet the quality requirements get out-sorted. Where the potatoes get out-sorted, it is up to the farmer to find alternative ways to sell the potatoes. The farmer needs actively find new solutions and make decisions. It is from planting to when the farmer will sell the potatoes and the timing for selling it.

From a farmer's perspective, economic value is essential. According to the farmers, they can produce food potatoes more sustainable if they get the right profitability. It makes the economic value in TBL the key to increasing social and environmental value toward sustainability within the primary production. According to the farmers this means that the Triple bottom line theory is more one bottom line in the context of potato producers. According to the farmers, with an understanding from stakeholders, the market and an increase in economic value, the social and environmental value would increase. In this way, the farmers could provide a more sustainable production. The understanding is needed to see how factors affect production and, by questioning norms, creates a development towards more sustainable food production.

# Acknowledgement

Throughout this thesis, I have received valuable help. Essentially, I would like to thank my supervisor PhD. Annie Roos at the Department of Economics at the Swedish University of Agricultural Sciences, who has been very helpful and supportive with all the great advice, feedback, and guidance during this time. I also want to thank my respondents for their generous participation, and without their participation, this thesis would not have been possible.

Uppsala, 2021

Madeleine Gillheimer

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# Abbreviations

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| SLU | Swedish University of Agricultural Sciences |
| TBL | Triple bottom line |
| GHG | Greenhouse gas |
| GCM | Garbage can model |

# 1. Introduction

Food is essential for human life, but food production is also one of the largest contributors to environmental impact (Hallström et al., 2014). The production of food contributes to greenhouse gas (GHG) emissions, acidification, and eco-toxication. Food is wasted throughout the supply chain, from the primary production to the end consumer (FAO, 2020). In the primary production, the amount of waste differs between different crops. Previous research estimates that 10 to 50 percent of the crops get wasted (Hjerpe et al., 2013; Naturvårdsverket, 2020). The environmental impact increases when food is discarded or wasted since production of food affects the environment. Eriksson (2015) states that food waste is an area of complexity. The waste contributes negatively to economic, social and environmental aspects.

According to Jordbruksverket (2020) and Livsmedelsverket (2020), the prevention of food waste is more important than the reuse of food waste. When food waste occurs, it can be reused for animal feed or get processed by digestion into biogas (ibid). By processing eatable food for any other use, the environmental impact lowers. However, the most beneficial action is to avoid food waste altogether. According to Jordbruksverket (2020), food waste is problematic throughout the food chain, from the agriculture to the consumers. Regarding waste, Naturvårdsverket (2020), states that it is essential to consider the entire food chain. Franke et al. (2016) also declares that food waste is a problem that needs to be considered. According to the authors, it is essential to conduct studies, increase knowledge and create possibilities and methods in order to eliminate food waste (ibid). Primary production, which is the first step in the food chain, cultivates, harvests, handles and stores food products before it becomes processed and distributed (CEC, 2021).

There are arguments which states that food losses and waste in the primary production occur due to quality demands and cosmetic requirements (Jordbruksverket, 2020). Retailers' cosmetic requirements have long been criticised and accused of being a vital cause of food waste in developed countries (Beausang et al., 2017). Retailers' specifications are mainly based on visual appearance such as size, colour, shape and defects (ibid). If the farmers' products do not meet the quality standards, the goods can be rejected by retailers. For

agricultural products, such as vegetables, the cosmetic standards are known as a primary cause of food waste. Due to the standards, it may be necessary for farmers to discard a large part of the yield. Concerning potatoes, cosmetic standards have proven to be a major cause of waste. One requirement, which originates from the quality demands, is that potatoes need to measure the right size (Franke et al., 2016). If the potatoes are too small or too large, they are left in the field due to the size requirements. Franke et al. (2016) argues that this is an example of how an eatable resource can become needless.

This thesis aims to study and develop an understanding of how the triple bottom line thinking is part of management decisions in small businesses. This thesis focuses on small businesses in the primary production who cultivates potatoes and are obligated to follow the cosmetic requirements. Potatoes are the third most common food crop (Chiurciu 2020). Potatoes contain carbohydrates, vitamins, trace elements and essential amino acids (ibid). The crop is also a major export commodity around the world. Potatoes make up a large proportion of the food production in Sweden and has done so since the beginning of the 19th century (Eriksson et al., 2016). Potatoes provide the Swedish population with essential nutrition and it has been an irreplaceable part of the diet for a century. Most of the potato production in Sweden is in the regions of Skåne, Halland, Östergötland and Västra Götaland (ibid). The trade-market with potatoes in Sweden does not only consists of the production and sale of potatoes in stores. The potatoes are also important a crop for industries such as peeling, processing and packaging.

## 1.1. Empirical problem

The food industry's main challenge is to provide humans with food in a sustainable way (Jordbruksverket, 2018). According to Wasserman (2009) the food sector contributes to social, economic and environmental impacts throughout the food chain since food waste arise in all stages. The waste in the food chain is creating financial losses and unnecessary environmental impact due to the structure of the value chain (Lindblom et al., 2014). The effect of waste in the primary production also creates negative consequences for farmers' economy, the availability of cultivatable land and the climate (ibid). These effects affect how farmers make decisions in agricultural businesses (Hardaker et al., 2004). The financial return can vary significantly in a small business due to what decision the farmer make.

When the crop does not fulfil the quality requirements, the farmer needs to identify alternative solutions (Östergren et al., 2014). Solution can be found throughout the whole process, from planting to selling the potatoes (Hardaker et

al., 2004). As a potato producer, it is essential to plan the production (Eriksson et al., 2016). A farmer faces most of the waste during harvest and storage. The waste leads to loss of income. The farmer can reduce waste by planning, using the correct management and by having the right storage conditions (Jordbruksverket, 2020). Therefore, the farmer needs to make different decisions at different times under different conditions.

## 1.2. Theoretical problem

According to previous research, the food chain in Sweden needs to be developed due to the wasted crops that do not meet the quality requirements (Franke et al., 2016). Within agribusiness, farmers' decisions are based upon various conditions such as weather, efficiency, demand, pricing and storage possibilities. Furthermore, economic, environmental, and social aspects are also taken into consideration when decisions are made (Hardaker et al., 2004; Lindblom et al., 2014).

The author of this study wishes to explore whether the theory triple bottom line (TBL) in combination with decision theory contribute to farmers' decisions concerning food waste. The values of TBL are economic, social and environmental (Slaper, 2011; Tate & Bals, 2016). Decision theory helps to explain how decision are made in various situations. By putting together TBL with decision theory, the study should review how and if farmers include TBL thinking in their small businesses regarding decisions about food waste.

According to Franke et al. (2016) and Jordbruksverket (2020), there is a lack of research on waste in the primary production. Franke et al. (2013) argue that there is a need to increase research of what causes the waste in the primary production. With further knowledge about how to prevent waste, Franke et al. (2013) and Jordbruksverket (2020) believe that farmers can increase profit of the entire yield. In order to understand how current decisions about waste can be change, there is a need to examine existing norms within the primary production.

## 1.3. Aim and research question

This thesis aims to develop an understanding of how triple bottom line thinking is included in management decisions in small businesses. To reach the aim of the study, the following research questions were established:

(1) What decisions do producers make regarding potatoes that do not meet the quality requirements or are discarded due to beauty defects?

(2) How does sustainability affect decisions making in the primary production of potatoes?

## 1.4. Defining food waste

The definition of food waste does not always show a simple picture, and previous research defines it differently (Lindblom et al., 2014). In this thesis, potatoes will be seen as food waste even if it gets used for something other than food for humans, because the potatoes' purpose is to go to the end-consumer as eatable. The potato industry has cosmetic requirements that can lead to the farmer's finding alternative uses for the potato (Östergren et al., 2014). The potato can be seen as food waste with these alternative ways because it will not be used for what it is intended. This description is based on Östergren et al. (2014) study. They believe the problem with the definition is where in the food chain it becomes food waste. They claim that researchers define food waste differently.

An example is if there is food waste before harvest or after harvest. Östergren et al. (2014) include products before harvest, whereas the research also includes inedible parts of production. While other define food waste often as (Naturvårdsverket, 2020):

> "Food which is thrown away but that could have been eaten if it had been handled in a different way" (Lindblom et al., 2014).

The food chain is complex, which make it challenging to define food waste and production losses (Lindblom et al., 2014). However, according to the EU (2002), food waste is based on definitions of food, and food means within the EU:

> "All substances or products, whether processed, partially processed or unprocessed, which are intended to be or can reasonably be expected to be ingested by humans" (EU, 2002).

Some researchers claim that crops before harvest or animals before slaughter are not included in food waste (Franke et al., 2013). It is seen as production loss rather than food waste. EUs (2002) definition of food waste only includes food which does not eaten by humans. Even if the primary purpose of food is to be eatable for humans, it can change to another purpose during the food chain (Lindblom et al., 2014). Food utilisation can decrease, and the food can change as a new product, and humans can eat it in another way.

## 1.5. Thesis outline

See figure 1 for the thesis outline. Chapter one introduces the thesis problems, purpose, research questions and a literature review of definitions of food waste. Chapter two provides existing research on the theories Triple Bottom Line, decision theory with Garbage can model and provides a conceptual framework for using it in this thesis. Finally, chapter three describes the method's choices regarding data collection, data analysis, quality criteria and ethical aspects of research design and how it is linked to research and applied.

Furthermore, chapter four provides the empirical analysis from the interviews with the two farmers linked to the theories. Chapter five contains a discussion of the analyses with purpose and research questions. Finally, chapter six presents the conclusion of this thesis.


*Figure 1. Study report outline. (Own illustration)*

# 2. Conceptual framework

The key to sustainability needs to involve several parameters (Spiertz, 2008). First, sustainability is based on meeting the needs of the present without compromising the needs of the future. Second, sustainable agriculture links three main goals: economic profitability, environmental health, and community equity.

## 2.1. Triple Bottom Line

Instead of only measuring profits, return, and investments, John Elkington wanted to include the value of environmental and social dimensions, and this is how the Triple Bottom Line framework (TBL) was born (Slaper, 2011). The framework has three value grounds: economic, environmental, and social aspects. TBL is also called for the 3Ps, and which stands for people, planet, and profit. TBL and the 3Ps' challenge is that they do not have a standardised unit of measurement (Norman & MacDonald, 2004). Profits are measured in money, but how should environmental value and social value be measured?

The TBL framework does not suggest that the company should only engage in environmental and social foundations, but rather that economic benefits should also be included (Gimenez et al., 2012). Economic sustainability is usually well understood, and environmental and social sustainability are more challenging to define (Norman & MacDonald, 2004). Today, stakeholders place more demands on companies within these values, and it is becoming vital that companies become transparent (Hubbard, 2006). The values by addressing economic, environmental, and social elements create social business by promoting honest relationships among stakeholders and adopting a fair revenue model (Tate & Bals, 2016). Innovative social business models aim to holistically address all three sets of constraints of their operating context, especially in developing countries. To be environmentally conscious, companies must cooperate with organizations that work with the environment and agriculture as a social business (ibid).

### 2.1.1. TBL in the agricultural context

Development and research have given agriculture a new dimension with the agreement of developing toward more sustainable agriculture (Saragani et al., 2020). In order to reach sustainable agriculture, the businesses should achieve the three values in TBL, the economic, social and environmental values (Slaper 2011). With the help of agricultural entrepreneurs and research, can innovation generate development in market trends. The TBL concept is not only used to illustrate what and how companies have on their agenda (Detre & Gunderson, 2011). TBL illustrate how it works as an instrument for different agricultural companies. The three values signify that companies work to maintain their environmental and social values regarding the TBL concept at the same time driving for economic effectiveness (ibid).

In economic perspective, profit deals with monetary capital, jobs, job growth, and investment (Detre & Gunderson, 2011). Economic perspective promotes socio-economic living standards. It emphasises sustainable development environments for economic benefits along with economic development for companies. In the environmental aspect, it is how the companies are related to the environment. Detre and Gunderson (2011) argues that companies must present that they do not contribute to any adverse environmental effects, for example such as polluted soil, air pollution and insufficient drinking water. Therefore, an important aspect is how agricultural companies are related to natural resources and how the resources are used (Detre & Gunderson, 2011 & Fauzi 2010). According to Norman & MacDonald (2004), the social performance can be more difficult to measure compared to the economic value. One way for measure the social value is to see how decisions in the businesses affect the society (Fauzi, 2010). For an example a business social responsibility and decision-making can analyse the organisations' decisions and how the relationship is for a sustainable business (Saragani et al., 2020). For this thesis, the farmers can be influenced by different social norms when a decision occurs. Therefore, analysing how agribusinesses include TBL thinking in their decisions can show how farmers are influenced by environmental, economic, and social indicators for striving toward sustainable business.

## 2.2. Decision theory

Being the decision-maker and take the right decisions for a business can be difficult. Decision-making can be seen as a rational process or an irrational process (Öhlmer et al. 1998). A rational decision is based on that the decision-maker is aware of his or her own values and aware of the situation. In rational

decisions, alternatives are carefully chosen by the decision-maker, and the decision-maker ranks outcomes in order to produce the best decision, regarding to the best interest for the business (ibid). The other example of a decision process is irrational decision-making process. The irrational process is when the decision-maker often does not know what they want and examine to few consequences and alternatives (ibid). According to Brunsson (1982, 1985, 1998) an example of irrational decisions is studies. Where the researcher does not examine enough options and consequences. According to Brunsson (1982), irrational decision-making can be fairly explained by three factors. The first is to be able to obtain and interpret the information that allows the decision-maker to make a rational decision. Secondly, we are influenced by psychological factors, which make the decision irrational. The third explanation of irrational decisions is partly based on practical restrictions, that may exit in decision making. An example is in case of too much information or incomplete information. The author Miner (2011) argues that the central decision-making should be transparent no matter which version of the decisions process. According to Resnik (1987), the decision theory collects logical, mathematical, and philosophical theories where rational individuals decide. Another explanation that decision-making processes can be different is whether the decision-maker is alone, or decisions are made in a group (Willock et al., 1999). This thesis aims to develop an understanding of how triple bottom line thinking is included in management decisions in small businesses. First it should describe the decision-making process for how triple bottom line thinking is included in the management decision-making of potato producers. Then, with the help of the garbage can model, it should view when quality requirements affect the farmers and are thrown down to several problems at the potato producer's level, without a link between solution and problem. The author wants to note that a problem does not necessarily have to be negative but only needs a solution.

### 2.2.1. Garbage can model

To understand how specific decisions can be in a decision-making process, the concept of the GCM should provide an understanding (Watson, 2006). The GCM is used to explain the possibilities in decision-making process within an organization (Cohen et al. 1972). The GCM comes from empirical studies of decision-makers, where the specific decision-making processes do not follow the rational models for decision-making. As explained earlier, the rational model for decision-making is decisions being made as a linear process, where alternatives are set up, and consequences are evaluated, examined, and finally made (Brunsson 1982, 1985, 1998). In the GCM, Cohen et al. (1972) describe that decisions possibilities can instead be viewed as a garbage can. The "garbage can" occurs when a business has a meeting and ideas are thrown down by the

participants. The ideas are a mix of problems and solutions for the business, which then has to be decided upon.

The model signifies four independent streams in an information gathering (Cohen et al. 1972). In this situation, it is thereby determining how much information is sufficient (Watson, 2006). The four streams consist of participants, problems, solutions, and decision opportunities (Cochen & Karatzimas, 2016; Jacobsen & Thorsvik, 2008). Participants are characterized by their access to decision-making possibilities and the ability to reach a solution (March, 1994). Participants have an importance for the decision-making process, due to different characteristics of this include, for example, goals, interests, contacts, and knowledge (Watson 2006). To define participants for this thesis, the stream of participants is the farmer and what goal and knowledge his/her have for producing potatoes. With the four streams, decisions are for solving a problem. Another stream is problem and it is something that comes from the outside, and it can engage, annoys or inspire. The farmers in this thesis receive information from external sources, and it is on their cultivation. It is seen as problem but in this thesis the author will find out how farmers work with the problem. If the problem from external sources inspirers or engage (ibid). The third stream is solutions, and it is normally an answer to the problem. For example, in the thesis case, the solution can be a new resources or new technology. The fourth stream is decision opportunities, and it is where situations in the business takes a decision problem to decide.

### 2.2.2. Decision theory in the agricultural context

In a study by Öhlmér et al. (1998), they argued that the decision-making process for farmers, often resulted in difficulties, since the farmers had struggles to find relevant information when a decision should be made. To create an understanding with decision-making processes in farmer's situation, we have to understand what happens in the context of the person who will make decisions and what interactions he or she is involved in (Lindblom et al., 2013). According to Lindblom et al. (2013), decision-making processes need to be distributed over people and their social environment. Lindblom et al. (2013) also state that the researcher needs to study the situation as a unified system to study decision-making processes. The whole situation must be understood since farmers have challenges and obligations to meet, before-mentioned as cosmetic requirements.

Making decisions in complex situations and sensitive areas is a task that is difficult to solve, and conflicts can easily be created (Lindblom et al., 2013). *Agriculture* is a sector that faces many requirements and factors that can be affected at local and global levels. Lindblom et al. (2013) declare that this creates a problematic situation for the farmer when making informed and appropriate

decisions. Agriculture's expectations and challenges are demographic change, biodiversity conservation, sustainable supply of eco-services, climate change, lack of energy and other resources, policies and conflicting strategies, consumer preferences, and continuous technological development (ibid). Farmers are also expected to produce food, preserve, and protect cultural heritage, meet environmental goals and the future needs in local and global communities. In addition to these expectations, farmers are expected to be financially profitable. It makes that the decision creates difficulties. Lindblom et al. (2013) argue that there is a need to increase collaboration between actors in agriculture. The challenge of cooperating with farmers is that there is often a lack of competence and understanding from the other part about the demands placed on farmers. According to Östergren et al. (2014), the food system and the food chain need to be developed to reduce and prevent food waste to achieve resource efficiency. In primary production, different decisions occur in agriculture production. If the food does not meet the required quality, alternative ways are created for the food to be used, even if it was not intended (ibid). According to Östergren et al. (2014), is an alternative for the farmer is to leave the crop in the field when it does not fulfil the quality requirements. These choices have a financial impact, and that food waste arises in primary production instead of further down in the food chain (ibid). Although, this is the most resource-efficient way to produce food in the long run. When the farmer makes decisions and how the farmer uses the produced crops.

## 2.3. Theoretical synthesis

The following section lays a structure for the analysis and discussion part. The theories should create a framework for the thesis. Further, the theoretical synthesis is to increase the understanding and how the theories are linked in the research aim. The framework will also connect with the material from the collection of the empirical data. The TBL and decision theory should explain an understanding if the farmer makes decisions based upon economic, social, and environmental values. The following figure (Figure 2) shows the combination of TBL with the three values and the decision theory.

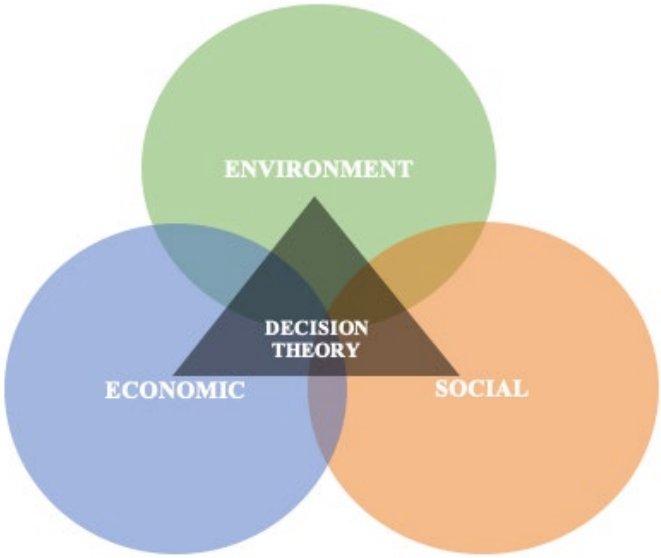


*Figure 2. The combination of decision theory and triple bottom line. (Own illustration)*

This thesis aims to develop an understanding of how triple bottom line thinking is included in management decisions in small businesses. To give the reader an increased understanding, the thesis should show how farmers face challenges such as ecological, social, and economic value. The environmental value refers to the company's use of energy and other resources and footprints the company leaves behind (Gimenez et al., 2012). Responsibility for environmental sustainability is often related to energy efficiency, waste reduction and emission reduction.

Regarding the waste in primary production, this thesis will provide the farmer's decisions to prevent wastage and when it occurs (Östergren et al., 2014). The other value is social value, where the focus is on both employees internally and society externally (Gimenez et al., 2012). Social sustainability includes values that provide fair opportunities, ensure quality of life and other social foundations.

The other presented theory is decision theory. Decisions theory is used to explore why and how farmers make their decisions. This study wishes to create an understanding of the context and the factors that can affect the farmer's decision-making process (Lindblom et al., 2013). To discuss how and what they base their decisions on of their opportunities and conditions. Since the decision process can be broad, the four streams from the garbage can should apply in the farmer's context. The model is when farmers receive a valuation of their production of potatoes from the external sources. The four streams of GCM consist of participants, problems, solutions, and decision opportunities (Cochen & Karatzimas, 2016; Jacobsen & Thorsvik, 2008). The data from the empirics should provide the reality from farmers perspective when it decides out-sorted potato due to the requirements. This thesis should provide an understanding of why and how farmers make their decisions depending on the situation and consider the three parameters of economic, environmental, and social perspectives. Hence, to see what we can learn and how combined theories build

upon each other. The theories should view what decisions the potato producer must make and consider due to the quality requirement. It should present if the farmer makes these decisions from a TBL thinking that includes economic, social, and environmental value or if they considers them at all.

# 3. Method

Qualitative research involves a study using and collecting various empirical materials that describe routine and difficult moments and meanings in the context of individuals (Njie & Asimiran 2014). The qualitative method is used explicitly to study a complex phenomenon or one with little information regarding the study area. Leedy & Ormrod (2005) indicate that qualitative research is not a way for the researcher to look for simple answers or quick results. In qualitative research, it means digging deep to understand a situation or process. Observation, interviews, and additional follow-up sessions often need more time and further investigation to understand a situation better. Qualitative research explores a wide range of dimensions of the social world (Njie & Asimiran 2014). Qualitative research involves the research participant's understanding, experiences and perceptions of how social processes, discourses, institutions, or relationships work and the significance of what they generate. According to Teherani et al. (2015), the social world is qualitative research's primary data collection instrument. By studying the social phenomena in natural settings of the qualitative approach. The researcher reviews why ways occur, what happens and what the studying occurrences mean to the studied participants. This qualitative method starts from the perspective and action on the subject studied (Alvesson & Sköldberg, 2018). Qualitative studies are a strategy for research where data collection and analysis often give a significant weight to words rather than quantification of numbers (Bryman & Bell, 2017). In order to achieve the goal of understanding, the qualitative method is more appropriate than a quantitative strategy. This study will contribute to a deeper understanding and not generalize the statistics and numbers of potato producers regarding the quality and quantity losses in potato production. It is why a qualitative approach is more suitable and chosen compared to a quantitative approach.

This thesis aims to develop an understanding of how triple bottom line thinking is included in management decisions in small businesses. The thesis should explain potato growers' perception of the quality standards and why there are these quality criteria. Moreover, it should answer the research questions with the help of a qualitative research strategy. Qualitative research enables in-depth contextual understanding and closeness to the participants involved in the study (Bryman & Bell 2017).

Furthermore, it is essential to be aware of its impact as a researcher and to have an objective role so that it is not affected by the research. In this thesis, the researcher had to follow up with the two respondents involved since the participants had a central role in the study. The follow-up sessions should provide an understanding, experiences and perceptions of how social processes and relationships work with the qualitative standards (Bryman & Bell 2017). It also should contribute to a deeper understanding of the thesis subject. Moreover, how farmers decisions are based and if the potato growers consider the TBL perspectives in the decision process.

## 3.1. Multiple case study

In order to answer the research questions, it is necessary to provide a deeper understanding of how farmers make their decisions and if they include the three perspectives of TBL within their decisions (Bryman & Bell, 2017). For this thesis, a case study method was selected, and it is based on the arguments that it was suitable for studying a phenomenon in its context. It is mainly when the phenomena imply necessary contextual conditions that are of interest to the thesis. A phenomenon can be studied through a case study within one or many cases. In this thesis, two farmers represent each case if they consider the TBL perspective in their decision-making process. Case study research is essential for the in-depth study of participants involved in the phenomenon within its natural context and perspective (Halkias & Neubert, 2020). The multiple-case study provides replication data and increases earlier research results with new and essential theoretical directions. The multiple-case study design is a valuable research tool. It allows different perspectives on the subject and contrast to compare the findings obtained from the cases (Bryman & Bell, 2017). What we can learn about decision theory and TBL in agriculture depends on if the farmer considers the TBL within their decisions. This thesis aims to see how farmers make their decisions, considering the frameworks that the trade set up and how the farmers from different situations make the decisions.

## 3.2. Literature review

With a literature review, the thesis has created a base for the methods used to analyse data (Bryman & Bell, 2017). With the help of articles and books, the literature review has guided the author in the research area. Going through existing literature helps the author narrow down the work with the help of themes and other supporting questions. When reviewing the literature, Bryman & Bell (2017) states that the reader should be critical of other researchers' viewpoints.

However, as a writer, one should not forget the intention of the work and be aware when reviewing existing literature.

The author of this thesis had a primary theme for this study. Nevertheless, reading existing literature made the base for this work more complex than expected. According to Bryman and Bell (2017), the author should know that literature reading is not over when the author has begun data collection. After the data collection, a continuation of search and reading for relevant literature is needed in this thesis (Booth et al., 2016). Since the author is interested in food waste, existing literature indicates that food waste was not as simple a definition as intended. With a literature review of research articles, books and internet-based sources, the author of this study has created a basis for looking at the whole truth (ibid). By comparing and identifying the studies' assumptions, theories, data, and methods, the author can pinpoint the underlying disagreements responsible for debates in the literature (Knopf, 2006). After this, the author can target the research on one of the underlying conflicts, which can help resolve a current debate. By evaluating these elements critically, the author can show problems or flaws in existing studies. The author can fix one or more of these problems in the literature in their research.
Furthermore, the existing research has overlooked and framed the research to fill this gap by looking for critical problems. The thesis creates a credible image with motivating and argued sources for the author's study (Bryman & Bell, 2017). When searching for literature, it was through search engines like Google, Google Scholar and peer-reviewed articles. Moreover, the author has used books from the Swedish University of Agricultural Sciences (SLU) library at Ultuna, in Uppsala. The databases need to formulate keywords and keywords to be used to find suitable references. Therefore, the author had to delimit the search parameter on publication date, keywords that help define the research area. In this study, the keywords have been based on selected theories and food production in the primary sector. The keywords are TBL, decision theory, primary production, primary sector, food waste, production waste and production losses.

## 3.3. Selection

The author has used personal contacts to reach the farmers to find relevant respondents for this thesis and interviews. This study will elevate the respondent's perspective on their view of the demand placed on their agriculture. It creates an understanding of today's challenges from the farmer's perspective and future challenges regarding waste and production losses. Therefore, the author has chosen to link the theories of TBL and decision theory for this thesis. TBL is a theory where the ground is the three different values economic, social, and

ecological values. Since demands from consumers and trade regulate agriculture, the farmers need to make different decisions during production. Of regulation, this has made the second theory, is the decision-making theory.

The selection has been two potato farmers, and they have production in Sweden in Östergötland. The respondents are between 40-50 years old and are the owner of their production on their farm. One respondent produces between 1500 - 3500 tons of potatoes per year, and the other respondent produces around 4500 - 7500 tons per year. By explaining why and how these requirements are established, an interview with the CEO from Svensk Potatis has also been conducted. The author reached the respondents by email and text message for settled a meeting for the interviews. Using personal contacts can have a critical impact on the study (Bryman & Bell 2017). First, this may mean that the respondents do not want to respond to or answer specific questions because they know the study's author. Second, it can impact how the respondents want someone like the author of the thesis to perceive them (Alvesson 2001). Finally, it means that the author needs to be objective and reflective during his interviews.

## 3.4. Semi-structured interviews

This thesis has used semi-structured interviews with open-ended questions as a tool to collect data. The open-ended questions allow the respondent to answer with their own words and provide valuable information for the analysis (Bryman & Bell, 2017; Vaughn & Turner, 2015). The author has done interviews two times with the two farmers (see Appendix 1 and 2). Having two interviews contributes feedback with the answers from the interviewees' first interview and being able to build further on selected theories to understand the agricultural context. Another interview was conducted with the CEO of Svensk Potatis, Anders Huldt (see Appendix 3). The purpose of the interview with Anders was to gather information and perspective about the potato market (see Appendix 4).

Semi-structured interviews are applied in research when the author wants the interviewee to have freedom and answer and formulate the response in his/her way (Bryman & Bell, 2017). In this approach, the researcher uses specific themes based on what is to be touched upon, often called an interview guide. The intention is that the person who is interviewed should have the opportunity to answer in their way, and still, during the interview, the questions do not have to come in the same order as the interview guide (ibid). There is additional room to ask questions that do not come from the interview guide in semi-structured interviews. As a result of asking questions about the themes, new subjects can come up during the interview and give the researcher a deeper understanding of

the subject. With approval from the respondents, the author has also been able to record the interviews. Thru recording, it made it possible to rewrite the notes and read through the material again and take notes simultaneously.

As a result of the outbreak of COVID-19, personal meetings and travelling have not been possible due to restrictions. Therefore, the interviews were conducted by telephones with the two farmers and the CEO Anders Huldt from Svensk Potatis.

## 3.5. Data analysis

The author has chosen to use qualitative content analysis and thematic coding methods to analyse the collected data. A circumstance within gathering empiric material is that it can be demanding to know how much data to collect and whether the data collected is sufficient (Bryman & Bell, 2017). The theoretical saturation is an instrument to determine when the added data does contribute anything significant to the selection purpose of the study (Bryman & Bell 2017). It means that if theoretical saturation has been reached, which means that the author can devote time to deepening the theoretical analysis instead of further empirical analysis. Theoretical saturation is when the collected data no longer provides new information. According to Bryman & Bell (2017), by using theoretical saturation, the author can assess when more interviews do not need to be done to fulfil the purpose of the thesis. When the author had reviewed the conducted interviews, it resulted in the collected material fitting in with concepts and selected theories for this thesis.

Bryman & Bell (2017) states that coding of empirical data should start as soon as possible, and the author should read their field notes without any interpretations. For this study, thematic coding has been conducted to analyse the data. It was done to sort a large amount of data and analyse the respondents' answers to the selected theories for the thesis. Thematic coding is performed by marking a page, a paragraph, or a word in the empirical material. The use of coding generates a reduction in the data collected and makes it easily accessible for analysis (Linneberg & Korsgaad, 2019). It leads to raising the quality of the analysis and the result. Coding the data collection showed the keywords that the farmers were repeatedly using. The keywords are factors, norms, understanding and decision. With those keywords, the author could analyse the relationship between TBL theory and economic, social, and environmental aspects and link the decision theory based on the farmers' decisions for preventing food waste.

The gathered material from the interviews is analysed with the qualitative content analysis (Krippendorf, 1989). The qualitative content analysis defines itself as a

framework of an approach to the empirical, methodological, controlled analysis of texts within the farmer's context of a discussion of the qualitative requirements (Mayring, 2000). *Qualitative content analysis* is a technique used to make replicable and valid outcomes from data to farmers context (Krippendorf, 1989). Qualitative content analysis is an approach where the researcher searches for underlying themes in the studied material (Bryman & Bell, 2017). This approach helps to bring out different themes.

Furthermore, the author chooses to code the parts where the data can be matched to the chosen theories and analysis concept. When reviewing codes, the author should critically review how they would be related to theory and any correlation (Bryman & Bell, 2017). By studying and creating an explicit part of the empirical material, coding is an application used for qualitative analysis (Linneberg & Korsgaad, 2019).

The social value of TBL has been challenging to answer for the respondents during the interviews. With the coding, social values become coded answers, even though the respondents could not answer the questions regarding the social value (Linneberg & Korsgaad, 2019). Coding has signified a suitable method for organising the collected data from the interviews. The content analysis has provided the data with the follow-up interviews with the farmers, a supplementation of questions connected further to the theories (ibid). The author could see that data collected in the second round followed the already established themes, even if the first interview had open-ended questions. The answers were very similar to the ones earlier. It meant that the collected data had reached theoretical saturation.

Later in chapter 4, the author has chosen to use phrases in the text in the empirical analysis. The phrases are developed to link the theories and the relationship to the respondents' perspectives (Åkerlund, 2017). Motivation for phrases reminds the reader of the conditions or connections. This thesis develops the chosen theories. It is to make the reader interested and create a more effortless flow for the reader.

## 3.6. Quality criteria

The quality criteria trustworthiness is used in quality research (Bryman & Bell, 2017). Trustworthiness within quality research builds upon creditability, transferability, dependability, and confirmability. Communicating the results from the interview gives the study an aspect of credibility that deals with reliability. It presents the collected data from the interviews as credible and trustworthy. Since this study has collected data from respondents, the author has done a respondent

validation during the process. As a result, the respondents have received a draft of the gathering from the interviews. Furthermore, the respondents have confirmed the material from the interviews.

A second criteria is transferability, which is assessed by whether the study has been implemented or applied in other contexts (Bryman & Bell 2017). This study has used a research method that is applicable in other contexts. It allows others to use the same method for other research areas. However, the aim of this study is not to generalize. The thesis aims to develop an understanding of how triple bottom line thinking is included in management decisions in small businesses. The author is going to study two potato producers' contexts to provide and understand why waste and losses occur in the primary sector and how quality standards affect the primary sector.

Bryman & Bell (2017) state that the selection mainly depends on whether the author wants to generalize the result of the research. Generalization is when the study is to be used in other types of situations that it is the probability sample that makes the research representative. The opposite of this is non-probability selection, which is not selected from the principles of probability selection. By fulfilling the third criteria dependability, the study has presented a complete and accessible description of the thesis all aspects of the research process. In addition, supervisors and classmates have reviewed this thesis through the course — for example, thru seminars.

The fourth criteria are confirmability. Bryman & Bell (2017) believe that it is impossible to achieve complete objectivity in joint research. However, the researcher must ensure that he or she has acted in good faith. As researchers, we take the help of pre-understanding, which consists of experiences, expectations, knowledge, stereotypes, prejudices, and categories (Alvesson, 2001). The researcher must be aware of his or her personal opinions not to affect the study. For example, the author of this thesis study at SLU is interested in the subject of production waste. The person needs to be aware and critical not to risk the thesis results. The researcher's personal opinions should not affect the outcome. In the thesis, the researcher is objective towards the research. Bryman & Bell (2017) consider that reflexivity is a solution to the researcher's positions in research. As a researcher, to be aware of and how the study affects the participants and the researcher. Alvesson (2003) believes that reflexivity describes how the researcher uses data collected from the interviews, where the researcher needs to be aware of their situation. To acknowledge and question what can be possible in a context.

## 3.7. Ethical consideration

Researchers need to consider several ethical aspects in their study (Bryman & Bell, 2017). One ethical aspect is participation to ensure that there will be no harm to those involved in this thesis. Some of the ethical principles are the information requirement, the consent requirement, confidentiality and anonymity requirements, the use requirement, and false presumptions (ibid). The consent requirement and the information requirement indicate that the researcher for the study describes the purpose of the study and which parts will include, and that participation is voluntary. It indicates that the person participating in the research has the opportunity to interrupt whenever this person wishes (Munhall, 1988). Before collecting the interviews, the author has informed the respondents of an open question about participating in this thesis. Another necessary ethical consideration is the confidentiality and anonymity requirements, which the author needs to consider. The researcher has considered the participants' integrity and considers how the author provides information in the thesis (Kvale & Brinkemann, 2009). Both respondents were asked if they wanted their names published in the thesis. One of the farmers wanted to be anonymous, making the author decide that both were allowed to become anonymous. In this thesis, they got fictitious names, and the respondents go under fictional names as Erik and Niklas.

The respondents' information has been stored so that unauthorized persons do not have access to the material, and it is only available for the author of this thesis. Therefore, the usage requirement is collecting data from respondents, and that information should only use for this thesis.

The last ethical principle is false pretences (Bryman & Bell, 2017). It means that the researcher does not give the participating persons misleading or false information about the thesis. The author discussed the thesis purpose by message and by telephone when the interviews were conducted. In order to avoid harm to the participants, the author asked if they wished to remain anonymous in this thesis. It means that some of the material from the interviews got removed, so the reader cannot determine who the interviewee is. This study contains a reflection of the respondent's context in which they work. Reflecting is about how we think and question (Alvesson, 2001). With a reflection of the respondents' reality, this type of research should create a deeper understanding of how the practice appears for the respondent. A researcher needs to maintain an objective character and be aware and critical of their values not to affect the study.

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# 4. Empirical analysis

In this chapter, the empirical data analysed with the selected theories will be presented. The chosen headings in the empirical analysis are: *Triple bottom line, Environmental and social norm/values, Relationship to the values in agribusiness, Decision-making process, Making the right decision with the four streams of the garbage can model,* and *What values make these decisions*. These chosen headings are to discuss the research questions and the purpose. The respondents, Erik and Niklas perspectives, will be presented under the headings connected to the understanding of how triple bottom line thinking is included in management decisions in small businesses.

The author has chosen concepts that did come up repeatably during the interviews. Therefore, the words and sentences were selected when farmers make decisions, why they make these decisions, how and if they are related to TBL values. Both respondents are between 40-50 years old and are the owner of their production on their farm. Erik produces between 1500 - 3500 tons of potatoes per year, and Niklas produces around 4500 - 7500 tons per year. Although the two respondents, Niklas and Erik, have different sizes on their farms, various production volumes, and packaging and sales of multiple conditions, similar answers and problems arise in their potato production. The purpose of the empiric is to gain an understanding of managers' decision-making, and although it is possible to learn about potato cultivation and food waste along the way, the primary aim is a deeper understanding of TBL in decision-making.

## 4.1. Triple bottom line

The TBL theory was developed to measure all three economic, social, and environmental values (Norman & MacDonald, 2004). It sets how the company work toward sustainability and society. These values illustrate how agricultural companies can use TBL as an instrument and if they consider these values in the decision-making process (Detre & Gunderson, 2011).

In the process of producing the right potatoes for the trade, the potato gets through various parts. From the potato is planted until it leaves the company, sorting

occurs because they do not meet specific requirements. At the same time, Huldt (2021) states that today's farming industry overproduces potatoes compared to consumption. To better understand the primary production and how many potatoes are sorted out during the process due to beauty defects, the word waste needs to be defined in the potato industry, believes Niklas. According to Niklas, there is not much waste in the potato industry. Erik and Niklas picture of food waste is when the potatoes are thrown away and not used. For what is sorted out, it uses for something else. Niklas estimates that the potato industry is built on the fact that the out-sorted potato is available. It means if all potatoes were going to the consumer, the industries would have no potatoes. Because of the quality rules, all potatoes from Erik and Niklas does not go to the store. Even if the potatoes do not sell for the primary purpose, they still utilize them, and Niklas then sees this as not an unused resource.

### 4.1.1. Environmental and social norm/values

Increasing academic research and practice pressure can develop innovations and market changes (Saragani et al., 2020). The quality norm that exists for potatoes provides perspectives on both social, economic, and environmental value. Achieving resource efficiency in the food chain would reduce and prevent waste (Östergren et al., 2014). The financial aspects and taking care of resources play a significant role in the food chain. Preventing and reducing waste will benefit the farmer in an economic value and environmental and social value. One expectation and challenge agriculture face are the consumer's preference (Lindblom et al., 2013). Present, both farmers need to sort out 5-15 per cent of their production due to the preferences that come from demand. According to both farmer they believe that:

> Sweden’s potato growers need to become better to grow what the trade requires for an economic, social, and environmental value.

Erik believes that the quality norms could be questioned to a certain extent as it is currently. According to Erik, the food industry can be developed, and how potatoes are sold in the grocery stores should also be developed. More potatoes could be sold to the homes and used for the primary purpose by developing the sales. Erik states that the quality standard for potatoes is something the trade demands and not as Lindblom et al. (2013) declares in the research on challenges and expectations for farmers. Lindblom et al. (2013) state that it is the consumer's preferences, but Erik believes this is not consumer demand. Because the consumer would not see the beauty defect on the potatoes if they were in a package with the same beauty defect, the beauty defects or size defects do not change the taste of the potatoes. However, the development of how the sale of the potatoes needs to discuss declares Erik. Connected to Eriks point of view, Saragani et al (2020)

wonders how willing the food industry is to develop the social norms and also to question them. By questioning the beauty defect on potatoes and how it is selling today, quality norms and social norms can change to a sustainable business, according to Detre and Gunderson (2011). Moreover, it is important to develop and review how recourses are used (ibid). At the same time, the other farmer, Niklas, believes the potato industry needs to have a balance. Farmers should not grow more than is eaten. Niklas believes that the biggest challenge in reducing waste is to grow the right amount, even if it is based on industry and animal feed, so are the potatoes utilized. Huldt from Svensk potatis also indicated that it would not be grown more than what we ate or, vice versa, forced to eat more. Niklas considers that the industry needs the share. One solution, according to Niklas, could be growing other potatoes for the industry in a case of an increased quantity for the end consumer.

### 4.1.2. Relationship to the values in agribusiness

According to both farmers, they constantly take different decisions to develop the production. They develop by experience, and the farmers want to develop the crop rotation and build new storage space that has better storage, also review new varieties on potatoes. Producing what is needed creates an economic value for the farmers. An example that Erik said is that a few years ago, the requirements for potatoes were strengthened. According to Erik, even if it was a few per cent, it did not affect the consumer at all, but it affected farming a lot. According to Norman and MacDonald (2004), companies must measure the social and environmental dimensions of the TBL model. It means that companies have greater responsibility and obligation to society.

> Somehow, an understanding must occur for an economic, environmental, and social value.

Lindblom et al. (2013) claim that there is often a lack of competence and understanding regarding the demands placed on farmers. The lack of understanding is something that Erik agree upon. Erik believes that there must remain an understanding for the farmers. If the farmers are to produce the quality that trade requires, they need to get rightly paid. According to both farmers, it is possible to produce the quality of the potato, but the farmers must have profitability in farming to solve it. According to Saragani et al. (2020) the values within TBL affect each other. If profitability is increased, the ecological and social values also increase. In this situation, an increase in the economy will increase value in the ecological and social aspects of primary production is supplemented if the farmers get increased profitability. According to Sarangani's research (2020) and Detre and Gunderson (2011), the importance is how agricultural companies use resources and produce more innovations with the help

of increased research. According to the farmers, they can produce better quality through increased profitability. It would help the food chain in primary production and improve the use of resources. Erik also criticized if Sweden has an overproduction of potatoes that Huldt (2021) indicated, why do Sweden import potatoes?

## 4.2. Decision-making process

To understand a decision-making process among farmers, Lindblom et al. (2013) believe that one must understand what is happening around them in the environment and what the farmer is involved in. Factors such as soil, conditions, quality standards, variety choice, and demand play a large part in how the farmer should get as good a potato as possible. These factors are for reducing the wastage/sorting of the potatoes for primary purposes. Each farmer needs to grow the right sort as requested.

The society requires that farmers produce food, preserve, and protect cultural heritage, and meet environmental goals of the future, which are in local and global communities (Lindblom et al., 2013). According to Erik and Niklas, their decisions start with soil type, variety choice, and demand. Because of the quality standards today, the farmer needs to find alternative ways for the potato if it does not go through. Due to beauty defects and size defects that occur during cultivation, the farmer needs to plan how the potatoes will leave the company and find another sales channel. Finally, when picking up the potatoes, decisions such as storage have to be made, where the farmer can take risks if the storage process is good.

### 4.2.1. Making the right decision with the four streams of garbage can model

How specific decisions are made in the decision-making process, the concept of GCM model contribute to understanding (Watson, 2006). The GCM can be seen where all problems and solutions dump by the participants in an organization or information comes from external sources. When both farmers receive information about their cultivation from external sources, they must decide to find alternative ways for the potatoes. The GCM symbolize the choices and decision-making situation of different streams, and the streams are independent of each other (Cohen & Karatzimas, 2016). The streams meet in an information gathering. It is four streams containing problems, participants, solutions, and decision opportunities (Jacobsen & Thorsvik, 2008).

Factors which affect the right decision and right time to sell the potato.

The respondents believe that the out-sorted potatoes, which have beauty defects, come from the cultivation process. It begins in the starting process, but these factors occur later in storage, such as beauty defects. In these situations, the farmer must decide the time to sell the potatoes, if it should be directly on the harvest or soon after. This is because it is a risk for both to store the potatoes, and it can become more challenging to sell later. Niklas and Erik estimate that 5–15 per cent of the potatoes is out-sorted due to beauty defects. Therefore, both farmers need to find other sales channels for the production. One stream is the problem, which Jacobsen and Thorsvik (2008) brought up can connect to the farmer's situation in the decision-making process. The problem occurs in this situation when the potatoes do not fulfil the quality requirements. The stream of participants is if they want to continue with the cultivation of potatoes (ibid). The other two are solution and decisions opportunities. According to both farmers, they can send the potatoes away if there is a demand for feed, starch, or peeler industry. Erik said that some potatoes that do not meet the size requirements are sorted out. The smaller potatoes are not acceptable for sales in the stores, but the smaller potatoes have a demand in the restaurant business.

### 4.2.2. What values makes these decisions?

Values combined with decisions

According to Hubbard (2006), stakeholders demand increases on companies, and companies must be transparent. Both farmers are aware of the importance of working actively for a good example as a producer of the Swedish Food industry. The respondents believe that they are good at taking care of the environment since it is the environment they live for. Suppose they do not take care of the environment; they damage themselves. Because the farmers choose to sell the out-sorted potatoes, the resource used. It creates a sustainable perspective on how the farmers decide to use the resource—Erik and Niklas choice based on the most profitable and opportunities for the situation. Farmers want to get rid of their harvest at a price that makes it financially sustainable for them, but at the same time, they need to take risks to storage it and if it is going to sell. Erik believes that the organization Svensk Potatis can play an essential role in the classifications because they estimate the quality of the potatoes. Svensk Potatis and the foundation could influence if they change their view of what they could accept in-store. It means that good potatoes are thrown away or end up for other purposes.

# 5. Discussion

This thesis aims to develop an understanding of how triple bottom line thinking is included in management decisions in small businesses.
With decisions theory and TBL theory, this thesis review what a potato producer make because of quality requirements connected to economic, social, and environmental value perspective.

Earlier research has shown a lack of studies on production waste (Franke et al., 2016; Jordbruksverket, 2020). Research by Franke et al. (2013) has stated a need for improved screening of the cause of wastage in primary production. More research requires on how quality requirements and norms affect wastage and what can prevent it. With more knowledge about primary production, the producers can increase their utilization of the entire production to reduce waste (Jordbruksverket, 2020; Franke et al., 2013). Henceforth, to meet social changes, a review of current norms is needed on why certain crops get discarded and how the waste/losses problem is in the primary production. The interview with the two respondents has contributed to how farmers include TBL in their decision-making process. Farmers have provided their perspectives on current requirements, production waste, and how farmers can develop to a more efficient production.

## 5.1. What decisions do producers make regarding potatoes that do not meet the quality requirements or are discarded due to beauty defects?

According to Lindblom et al. (2013), one needs to understand the context of farmers to understand their decision-making process. According to the farmers, they make decision upon soil type, varieties, and the demand that remains. It is about what conditions and opportunities the farmers have and by making the right decision can make a big difference in returns (Hardaker et al., 2004). The decision-making method starts from planting to cultivation for the farmer. In different steps, the farmer can decrease the losses by planning, having the correct management, storage, or finding an alternative for the potato if it does not meet the requirements as food potatoes (Eriksson et al., 2016; Jordbruksverket, 2020).

For example, the farmers believe that the sorting of potatoes, which have beauty defects, comes from the cultivation process, but these factors occur during storage. It is in storage where the discolouration grows, but it starts from the cultivation. In these situations, the farmer takes risks for storing or to not. They must decide to sell the potatoes immediately at harvest or shortly after. This is making it difficult for the farmers to sell later. With the help of the GCM, it views when quality requirements affect the farmers and are thrown down to several problems at the potato producer's level, without a link between solution and problem (Cohen, March & Olsen, 1972).
The GCM four streams showing where a model can apply in their context and how farmers need to make decisions out of their situation (Watson, 2006). An example of the situation is when the potatoes do not fulfil the quality requirements, and both farmers need to find an alternative solution (Östergren et al., 2014).

When external sources deliver the information that farmers have the potatoes downgraded and cannot provide it to the trade, problems occur. Participants are characterized by their access to decision-making possibilities and the ability to reach a solution (March, 1994). The participant for the farmers is if they still want and can produce potatoes even when the problem arises. According to the respondent, farming is something they live by. The both farmers get the potatoes, 5 - 15 per cent are downgraded and not a large part of the production. The change in quality as a percentage is an example where an external source delivers information. However, Erik believes it is still unfortunate that the demand means that edible potatoes go to something other than the primary purpose. They must find solutions and look for different sales channels to eliminate their production and then make other decisions. Erik believes that the quality norms could be questioned to a certain extent as it sees today. How willing are the food industry to develop their social norms and question them (Saragani et al., 2020)? The understanding is needed to see how factors affect production and questioning norms for developing towards more sustainable production. Figure 4 presents the three values of TBL, economic, social, and environmental value. In the middle, the words, norms, factors, and understanding link these three values in the decision-making process and the words that often arise in the farmers' decision-making process. Previous theories have referred to the need to understand food production in the agricultural context (Lindblom et al., 2013; Saragani et al., 2020; Detre and Gunderson, 2011). It is something even the farmers are agreed.

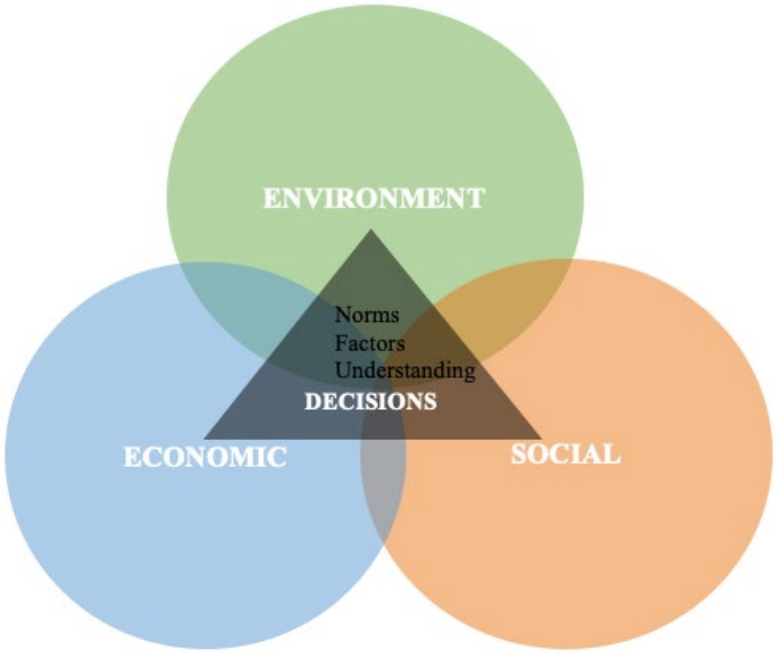


*Figure 3. The three TBL values, economic, social, and environmental value and three-underlying words that symbolise decisions theory in an agricultural context. (Own illustration)*

## 5.2. How does sustainability affect decision-making in the primary production of potatoes?

This thesis has focused on the picture of waste in primary production in agriculture and the impact the quality requirements have on discarded potatoes. Not all potatoes meet the quality requirements that are implemented today. The waste creates financial aspects and takes care of resources that play a significant role in the food chain (Östergren et al., 2014). An estimation from the farmers that 5–15 per cent of the production gets sorted, the farmers must make active decisions to continue utilizing the potatoes as a resource. The effect of losses in primary production creates negative consequences for producers' finances, the availability of cultivatable land and the climate (Lindblom et al., 2014). In the situations where the 5-15 per cent were out sorted, the farmer had to find an alternative way to sell the potatoes (Östergren et al., 2014). The farmer needs actively find the solution, and it can be from planting to when the farmer is going to sell the potatoes and the timing for selling it (Hardaker et al., 2004). Farmers have decision-making opportunities and a desire to solve to get rid of the part of production that does not meet the quality criteria. However, this is because farmers get more economic value from getting rid of the production than leaving the potatoes in the field.

In the earlier chapters, the conclusion is that there is a conflict about the definition of food waste. Both farmers did not see the out-sorted potatoes as food waste because potatoes have an industry based on the out-sorted potatoes. Even if farmers do not see potatoes as food waste, it still does not oppose the previous research from Franke et al. (2016) and Östergren et al. (2014). The farmers argue that they can produce better quality through increased profitability in potato production. In their perspective, economic value is essential, and if the out sorted potatoes decreased, it would provide that farmers production of food would even more work for an environmental value. It would benefit the food chain in primary production and improve resources even if the farmers already utilize the potatoes. The farmers still need to sell on other channels, where the problem can be that the demand for potatoes does not always exist on the other sale channels. So, an outcome where they cannot sell potatoes will create food waste. The implementation of TBL in agribusiness would give a negative perspective on the environmental and social aspects. Still, Lindblom et al. (2013) argue that to understand the farmer's decision, they must understand the context the farmers act within. According to Erik, the demand is coming from the trade and not the consumer that Svensk Potatis is responsible for.

## 5.3. One bottom line in potato production

Stakeholders place more demands on companies within TBL values, and it is becoming vital that companies become transparent (Hubbard, 2006). The values by addressing economic, environmental, and social elements create social business by promoting honest relationships among stakeholders and adopting a fair revenue model (Tate & Bals, 2016). Innovative social business models strive to holistically address all three sets of constraints of their operating context. To be environmentally conscious, companies must cooperate with organizations that work with the environment and agriculture as a social business (ibid). Both farmers are aware of working actively for a good example as a producer of Swedish food. The respondents believe that they are good at taking care of the environment. With reflection, understanding the responsibility towards the environment and social values, the economy is significant for both farmers. At the same time, waste in the food chain creates financial losses and an unnecessary negative environmental impact on its construction today (Lindblom et al., 2014). According to Erik, strengthening the quality requirements only affects the farmers because the strengthening qualitative leads to financial losses only for the farmers. Erik also considered that the demand comes from the trade and not the consumer. The strengthened requirements make more potatoes go-to alternative ways instead of the store and can be seen as unnecessary recourses. The argument formulated by the farmers is that potato growers can become better and meet what trade

requires, but that there is a lack of profitability in it. It means that in an organization and the context of agriculture, farmer Erik believes that increased profitability provides resource efficiency. The farmers also see that the organization Svensk potatis have a responsibility to understand the potato industry since Svensk potatis have a value in the trade and the producer's side.

Besides, Detre and Gunderson (2011) explain how agricultural holdings are related to natural resources and how these resources use. It would be improved if the aspect of the economy increased. It shows how sustainability affects decision-making from the situation where an understanding needs to increase. With resentment to farmers, they can develop more sustainability if they get the right profitability. It means that the Triple bottom line theory is more one bottom line in the context of the potato producers. With an understanding from stakeholders and the market and an economic increase, the other social and environmental values will increase. Through the financial understanding, which would ensure that the farmers get enough paid for the production. The social and environmental value will increase.

# 6. Conclusion

To understand how triple bottom line thinking includes management of the decisions, we have to understand the potato producer's context. The respondents believe that prevention and meeting quality requirements can be achieved if the profitability was better for producing potatoes. Therefore, it makes the economic value the key to increasing social and environmental value toward sustainability within the primary production. The conclusion of this thesis shows that the theory Triple bottom line in the context of the potato producers will instead be *one bottom line* for achieving sustainability.

According to farmers, they are the ones who are affected when strengthening and change in rules take place. Therefore, an understanding is needed in the context of farmers why they need to sort out, different possible sell channels for the potatoes and how farmers must adapt to find different solutions to get rid of their production. The farmers' decision-making process is something that requires to be highlighted. Producers' decision-making is affected by the challenges of being able to sell the potatoes for various purposes in order to avoid waste. The responsibility to utilize the potato production is placed on farmers regarding the decision they make.

According to the respondent of this study, everyone in the food chain must take responsibility to reduce and prevent food waste. Because of the complexity within the food sector, more cooperation is needed to make the decision-making process easier for potato producers. The respondents in this study don't perceive potatoes that don't get sold to consumers as waste. The farmers perceive it as another way of selling it when the quality requirements aren't achieved. The producers estimate that not all potatoes can be sold to consumers, which affects both their decision-making and profitability.

The general potato producer grows potatoes with the primary purpose to sell them as food for consumers, not to feed animals. Potato producers' decision-making linked to social, economic, and ecological values is limited by rules and regulations. Changes need to take place, not just with potato producers, in order to reduce waste before the potatoes reach households.

## 6.1. Future research

This study has been conducted to provide an understanding of why wastage and losses occur in the primary sector of potato farmers and how the quality norms affect the primary sector of the waste. By providing research into the quality norms in primary production, two farmers have contributed their perspectives on the prevailing requirements. The farmers have provided perspectives on connecting economic, social and environmental values in their decision-making process. Therefore, for striving toward developing in the food chain, it would be interesting to view the potato production food chain and study how other actors' approaches are toward food waste. How can the others in the food chain develop, and what are the others do? A study that should view the different perspectives on how stakeholders provide an understanding for farmers to develop more sustainable food production. What is the interest in the trade to bring in raw materials that do not fulfil the quality requirement and beauty flaws? How is the interest in increasing the price among farmers to provide an even better food potato?

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## Personal Communication

Anders Huldt, VD Svensk potatis, Interview, 2021-03-16

# Appendix 1 Interview guide

**First interview with the farmers:**
**Background:**
-What is your work role in the company and what does the production look like?
-How many ton potatoes do you handle annually?
-How do you handle the potatoes within the company? That is, do you sort, wash or do this by another player?
-Potatoes that disappear due to beauty defects "wastage":
-In which part of the process, from planting to the potatoes leaving your company, does most of the waste occur? Describe why the "loss" is greatest in that part.
-What percentage, in percent, do you estimate is "waste" from planting until the - potatoes leave the company?
-Does the amount of wastage differ between different varieties? If so, which varieties have the greatest loss and why?
-What decisions are made to reduce waste / sorting and when do you make the decisions?
-How do you work to reduce wastage in the short and long term?
-How do you think that potato growers and organizations that design regulations for classification should work together to reduce wastage / to increase profitability?
-How do you feel that other organizations treat / treat potato growers when the harvest is abnormally low?
-With the aim of reducing waste, what positive and negative effects do you see if larger quantities of potatoes with beauty defects would reach the end consumer?
-Who do you think are the key players in reducing wastage in the industry? Motivate your answer.
-In which part of the potato value chain do you think it is most important to work to reduce wastage? Why?
-In which part of the potato value chain do you think has the greatest potential to reduce wastage? Why?

# Appendix 2 Second interview

## Second interview with the farmers:

-How do you make decisions in potato cultivation? Are there decisions against environmental measures? Is it important for you to take environmental aspects into account?

-How do you see your agricultural company with regard to the social and environmental connections?

-What decisions are made in production and when sorting? Tell step by step.

-Which decisions play into the various decisive factors, for example when choosing a potato variety, do you prioritize finances, the environment?

-Decision on sales channel, is the decision that gives the highest pay, or get rid of the potatoes (does not matter) or do you choose to sell to them because they are considered nice, contacts?

-Same question again, decision by sales channel about the potatoes that are sorted out, is it highly paid, sold to "close contacts", what aspect does the decision affect? -What do you base your decisions on then?

-How does your agricultural company deal with your environmental and social impact?

-Why do agricultural companies want to reduce their environmental impact? Motivate.

-In connection with sorting, do you think that new initiatives can be increased to reduce the sorting of potatoes?

-How do you work with the next strategy, taking into account economic, ecological and social foundations, how do you do?

-In situations where the potatoes are sorted out because they do not meet the quality standards required by the trade, what decisions do you work with then?

-How do you think you as a farmer can influence / develop market trends, when it comes to sorting?

-What is your attitude to the sorting and quality standards today, regarding economic aspects and / or environmental aspects?

# Appendix 3 Interview guide for Svensk potatis

**Background**:
- What is your job role, and what does it look like?
- Why is certification and classes on the potatoes needed?

**Waste / Quality requirements:**
- Why are the quality standards designed as they are?
- How much disappears today due to beauty flaws? Examples, skin discolouration, plant cracks or crooked tubers, which means that it does not go through quality limits.
- What do you think about the rules that exist today? Should they be adjusted? Motivate your answer.
- What do you think about the quality of the potatoes / the quality of the sorting today? Should it change? Motivate your answer.
- When classifying potatoes, how are decisions made? For example, that there may be a maximum of 8% scale discolouration in group D?
- What is your attitude to the potatoes that do not meet quality requirements so that they come out to the grocery store? Do you think it should go through?
- What effects could occur if the requirements decreased? Or what needs to be done to create effects that can lead to reduced requirements?
- How do you work to reduce food waste? What does your plan/strategy look like in the short and long term?
- What does the influence look like, and how much can you influence?
- How much influence do you have as an organization? Which actors do you see as important in reducing the loss in potato cultivation? What are the disadvantages of reducing potato waste? What would it lead to if the requirements decreased?
- In which part of the potato value chain do you think it is easiest to reduce wastage? Why?

# Appendix 4 The quality requirement on potatoes

An organization that is an external source for the potato producers in Sweden is SvenskPotatis (Svensk Potatis, 2021). They have a classification system for determining the quality of potatoes in the Swedish potato trade. It is called SMAK's system. Quality criteria and standards are established because the potatoes were once too bad when they came out to the grocery store (Huldt, 2021). Quality criteria were created for the potatoes to be ensured from the start and give the growers a common yardstick. The supply system makes procurement between growers, packers, wholesalers and consumers more accessible, and every potato does not need to be analysed. With quality criteria, the consumer knows what it is getting when they buy potatoes in the store. The quality standard system guarantees that the potatoes are grown in a good way, that the handling of potatoes meets specific requirements (Svensk potatis, 2021). A stage that consists of cultivation, harvesting, handling, storage, and packaging ensures the consumer's quality.

The Swedish potato industry has an overproduction today, compared to the consumption by the primary customers (Huldt, 2021). The situations arise, so producers/growers compete because supply is more significant than demand. In a perfect world, there would be no waste. It would not be grown more than what we ate or vice versa, forced to eat more. The fact that farmers have to sort out can be criticized for the taste labelling, but it is complex (ibid). The potato industry has experienced growers, and they include cultivation development, variety development, packing and packaging. What can be reconsidered is whether the norms should develop. In a discussion about the level of standards, Svenskpotatis balance the different requirements. Huldt (2021) indicates that the producer side wants to decrease the norms, and the consumer wants to raise. Svenskpotatis can balance the criteria and have a more even development. Svenspotatis take samples when classifying potatoes on the field, which becomes a guiding analysis. The analysis certificate guides the grower on the quality of the production. The indication shows how much of the lot should be sorted out to keep a specific class type. If the farmer understands that the cultivation cannot meet the quality requirements, the farmer can control his cultivation lot early in the chain. If the

potato has ugly skin, the potato can be sold, for example, to a peeler or other type of activity such as starch or feed. The potatoes have a functioning market in such a way that there are alternatives for using the potatoes that are grown (Huldt, 2021).