



Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences

Department of Economics

Lean leadership -The Toyota Way in Agricultural Firms

*Christine Andersson
Hanna Andersson*



Master's thesis • 30 hec • Advanced level
Agricultural Programme – Economics and Management
Degree thesis No 879 • ISSN 1401-4084
Uppsala 2014

Lean leadership
-The Toyota Way in Agricultural Firms

Christine Andersson
Hanna Andersson

Supervisor: Hans Andersson, Swedish University of Agricultural Sciences,
Department of Economics

Assistant supervisor: Mozghan Zachrison, Swedish University of Agricultural Sciences,
Department of Work Science, Business Economics and
Environmental Psychology

Examiner: Carl Johan Lagerkvist, Swedish University of Agricultural Sciences,
Department of Economics

Credits: 30 hec

Level: A2E

Course title: Independent project/degree in Business Administration

Course code: EX0536

Programme/Education: Agricultural Programme - Economics and Management

Faculty: Faculty of Natural Resources and Agricultural Sciences

Place of publication: Uppsala

Year of publication: 2014

Cover picture: Lyne Robichaud

Name of Series: Degree project/SLU, Department of Economics

No: 879

ISSN 1401-4084

Online publication: <http://stud.epsilon.slu.se>

Key words: Lean, agriculture, management, case study



Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences

Department of Economics

Acknowledgements

This study has been inspiring and stimulating to write. Not only because Lean is timely in an agricultural context, but also because of the interesting people that we met during the study. This study has also contributed with a deeper understanding for the academic writing process.

First of all we want to thank our supervisors Hans Andersson and Mozghan Zachrisson for their coaching, comments and knowledge during the process. Thanks for your encouragement and support.

We would also like to thank the leaders, employees and Lean coaches at the agricultural firms for participating in this study. Without your contribution of information and time this study would not be possible.

Furthermore, we would like to express our gratitude to Ove Karlsson at Hushållningssällskapet Halland. He has inspired and supported us with contacts. He has also been an important discussion partner.

At last we would like to thank our friends at SLU. You have made our years of study incredible!



Christine Andersson



Hanna Andersson

Abstract

Swedish agricultural businesses are facing challenges in order to achieve long-term profitability. The opportunity to improve profitability and efficiency on farm level may be enhanced by management. One way to work with leadership is to use Lean. It is a management system that aims to improve competitiveness. Currently, there is a project where Lean is implemented into 100 agricultural firms. It may be questioned what is required of the leadership in order to implement and sustain Lean in the agricultural firms.

The aim of this study is to explain how agricultural firms can use Lean as a way to work with leadership, by evaluating indicators which have potential to make Lean leadership successful. This study approaches a qualitative method. It includes case studies of agricultural firms with personal interviews with agricultural leaders, employees and Lean coaches.

The result of this study shows that in order to sustain and implement Lean in Swedish agricultural firms it is evident that the leadership maintains the work with Lean and that there is a constant reminder of Lean in the daily work. The leader must implement Lean in the whole organisation and make the management system integrated into the company culture. As a leader it is important to make continuous improvements stepwise, establish a meeting structure and implement inspirational events such as study visits and use an external Lean consultant. There are changes in the agricultural firms in terms of working structure, working environment, motivation and communication, due to Lean leadership. Important skills for leaders which indicate potential success of Lean leadership for agricultural firms are clear, open-minded, ability to delegate and point out the direction.

Sammanfattning

Svenskt lantbruk har under en längre tid haft svårighet att uppnå långsiktig lönsamhet. Studier visar att lönsamhet och effektivitet på gårdsnivå kan förbättras genom ledarskap. Ett sätt att arbeta med ledarskap är att använda Lean. Det är ett ledningssystem som syftar till att förbättra konkurrenskraften. För närvarande finns det ett projekt där Lean införs på 100 svenska lantbruksföretag. Det kan ifrågasättas vad som krävs av ledarskapet för att implementera och bibehålla Lean i svenska lantbruksföretag.

Syftet med studien är att förklara hur lantbruksföretag kan använda Lean som ett sätt att arbeta med ledarskap, genom att utvärdera indikatorer som har potential att göra Lean ledarskap framgångsrikt. Studien använder sig av en kvalitativ metod. I studien ingår fallstudier av lantbruksföretag, där företagsledare, medarbetare och Leancoacher har intervjuats personligen.

Studien visar att det krävs att ledarskapet ständigt arbetar med Lean i den dagliga verksamheten för att upprätthålla och implementera Lean i svenska lantbruksföretag på långsikt. Lean måste vara integrerad i hela organisationen och företagskulturen. Det är viktigt att arbeta med ständiga förbättringar stegvis, etablera en mötesstruktur och genomföra inspirerande evenemang såsom studiebesök och utbildning. En extern Lean-coach kan också vara ett sätt följa upp och upprätthålla Lean-arbetet. Lean ledarskap har medfört förbättringar i lantbruksföretagen såsom i arbetsmiljö, arbetsstruktur, motivation och kommunikation. Viktiga egenskaper hos ledaren för att framgångsrikt arbeta med Lean är att vara tydlig, öppen, ha förmåga att delegera och visa riktningen.

Table of Contents

1 INTRODUCTION.....	1
1.1 PROBLEM BACKGROUND	1
1.2 PROBLEM	3
1.3 AIM	4
1.4 DELIMITATIONS	4
1.5 OUTLINE	5
2 LITERATURE REVIEW.....	6
2.1 INTRODUCTION TO LEAN.....	6
2.1.1 <i>Defining Lean</i>	6
2.2 DEFINITIONS OF LEADERSHIP	7
2.3 REVIEW OF LEAN	8
2.3.1 <i>Why Implement Lean?</i>	8
2.3.2 <i>The Importance of Leadership in Lean</i>	8
2.3.3 <i>Critics of Lean</i>	9
2.4 SUMMARY OF LITERATURE REVIEW	11
3 THEORY	12
3.1 LEAN LEADERSHIP.....	12
3.1.1 <i>Core values</i>	12
3.1.2 <i>The Toyota Way Leadership Development Model</i>	13
3.2 ALTERNATIVE LEADERSHIP THEORIES.....	17
3.2.1 <i>Situational leadership</i>	17
3.2.2 <i>Transformational- and transactional leadership</i>	17
3.3 SUMMARY OF THEORIES	18
3.4 CHOICE OF THEORY	18
4 METHOD	19
4.1 RESEARCH DESIGN	19
4.2 CASE STUDY.....	20
4.3 REVIEW OF THEORETICAL FRAMEWORK AND LITERATURE REVIEW.....	21
4.4 COLLECTION OF DATA.....	22
4.4.1 <i>Interviews</i>	22
4.4.2 <i>Direct observation</i>	24
4.5 DATA ANALYSIS.....	24
4.6 ETHICAL CONSIDERATIONS	24
5 EMPIRICAL DATA	26
5.1 FARM 1	26
5.2 FARM 2	28
5.3 FARM 3	29
5.4 FARM 4	31
5.5 FARM 5	33
5.6 FARM 6	34
5.7 CONCLUDING REMARKS FROM LEAN COACHES.....	36
5.8 CONCLUDING REMARKS FROM LEADERS AND EMPLOYEES	37
5.9 ASSEMBLY OF EMPIRICAL DATA.....	37
6 ANALYSIS AND DISCUSSION	40
6.1 LEAN LEADERSHIP´S CORE VALUES	40
6.2 THE TOYOTA WAY LEADERSHIP DEVELOPMENT MODEL	41
6.2.1 <i>Self-development</i>	41
6.2.2 <i>Coach and develop others</i>	42
6.2.3 <i>Support daily Kaizen</i>	45
6.2.4 <i>Create align goals and vision</i>	46
6.3 INDICATORS TO SUSTAIN WITH A LEAN INITIATIVE	47

6.4 GENERALIZABILITY AND QUALITY OF DATA.....	48
7 CONCLUSIONS	49
7.1 LEADERSHIP SKILLS FOR A SUCCESSFUL LEAN LEADERSHIP.....	49
7.2 CHANGES DUE TO LEAN LEADERSHIP.....	49
7.3 INDICATORS TO SUSTAIN LEAN LONG-TERM	50
7.4 FURTHER RESEARCH	50
BIBLIOGRAPHY	51
<i>Literature and publications</i>	51
<i>Internet</i>	55
APPENDIX 1: INTERVIEW GUIDE	56
APPENDIX 2: SUMMARY OF LIKER´S 14 PRINCIPLES.....	59
APPENDIX 3 BACKGROUND OF THE COMPANIES.....	61

1 Introduction

The following chapter presents the problem background and problem associated with the study. This chapter also includes the aim, delimitations and outline to give the reader an overview of the study.

1.1 Problem background

Swedish agricultural businesses are facing challenges in order to achieve long-term profitability (Ekman & Gullstrand, 2006). A contributing factor is an increasing import that is causing substantial competition for Swedish food producers. For example, 15 percent of beef consumed in Sweden during 1995 was imported, whereas nearly a decade it had increased to 42 percent in 2004. Furthermore, Swedish agricultural commodities have lost market shares in the domestic market for agricultural products from 75 percent to 50 percent over the course of 20 years (Ulvenblad *et al*, 2013). The value of Swedish primary food production amounts to 30 billion. Primary food production refers to production of primary products from harvesting, milking and farmed animal production. Denmark and Sweden have approximately same amount of arable land, yet Denmark's primary food production value amounts to 75 billion, which is 2,5 times as much as Sweden. Farmers in Germany, the Netherlands and Denmark increased net income from food production with 30-40 percent in 2011-2012, while the net income for Swedish food producers remained unchanged (www, Swedish Board of Agriculture, 1, 2013). Price fluctuations of food on the world market, in combination with a high demand on capital for Swedish farmers, require competitive agricultural business with an ability to adapt to rapid changes in the market (www, Swedish Board of Agriculture, 2, 2013). A competitive Swedish agriculture market will lead to farms with sustainable profitability, which may contribute to increased market shares in both domestic and export markets (Ekman & Gullstrand, 2006). The Swedish government is currently investigating how to improve the competitiveness in the agricultural sector (Regeringskansliet, Dir 2013:20).

According to the literature on farm efficiency, the productivity at the farm level varies between different farms (Hansson & Öhlmer, 2008; Oude Lansink *et al.*, 2002; Heshmati & Kumbhakar, 1994; Tauer, 1993). Furthermore, this implies that farmers may improve their performance, and thereby, their profitability. According to Hansson (2007), improved efficiency on farm level reduces costs and increases revenue. The profits can increase significantly if inputs and outputs are used more optimally (Lawson *et al*, 2004; Heshmati & Kumbhakar, 1994; Bravo-Ureta & Rieger, 1991). Companies which continuously work with efficiency improvements will strengthen their competitiveness and sustain in the long-term (Lund & Noell, 2002).

In Swedish agriculture there is an ongoing process of structural change towards larger units (Berglund *et al*, 2011). The need for management skills increases when farms grow, which implies more employees and partners. Kemp *et al* (2004) argue that the management of farms has always been critical in the production of food. In order to survive long-term, a sustainable farm requires management of biological, social and financial resources. It is evident that the management skills of farmers need to improve and develop. Farmers are heterogeneous with different backgrounds, education and values (Hakelius, 1999). In order to deal with this heterogeneity and an increasingly complex business environment, future farmers must develop leadership skills (Kemp *et al*, 2004). Leadership seems to have a substantial effect on various business outcomes (Bass & Bass, 2008). Mintzberg and Waters (1982) found that

senior executives could successfully change a firm by adjusting previous organisational strategies and structure. In a study conducted by Thomas (1988), 60 percent of all sales and profits in the British retail shops were attributed to changes in the top management. Collins (2011) revealed that a key factor for a company to successfully sustain itself in the long-term depended on leadership.

A way to work with leadership is to use Toyota's management system: Lean (Ulvenblad *et al.*, 2013). Since the publication of the book: *The Machine That Changed the World* by Womack *et al.* (1990), Lean has found acceptance in many different businesses on a global scale (Doolen & Hacker, 2005). Lean is a management concept and a philosophy that first was introduced by Toyota in Japan after the Second World War (Liker, 2004). The management system aims to create competitiveness, flexibility, a higher level of productivity and more customer-oriented business practices. Lean may optimize the use of resources by mapping processes in an organisation and make them more efficient (Doolen & Hacker, 2005; Rother & Shook, 1999). This management system offers opportunities for businesses; however, it also creates challenges (Sohal & Egglestone, 1994).

Liker (2004) stresses the importance of introducing the whole Lean concept in an organisation. Many companies only use one part of the Lean concept, which in some way is cheating and should not be compared with "real" Lean thinking. Lean thinking refers to when Lean practices are integrated in the whole organisation, from the top management to the employees. A successful implementation of Lean depends on the ability to develop leadership, create teams and a positive culture within the company. Moreover, it is of importance to create long-term relationships with suppliers, define strategies and encourage new knowledge. A major challenge is to sustain Lean initiatives (Bodek, 2008). The use of "sustain" in this contexts means to provide continuity in the Lean process. In a variety of industries such as aerospace, computer science, manufacturing and automotive assembly, there are many examples of successful implementation of Lean (MacDuffie *et al.*, 1996; Laughlin, 1995; Houlihan, 1994).

Convis and Liker (2012) stress the importance of leadership when successfully using Lean. Furthermore, Womack *et al.* (2007) conclude that leadership is a key to success in an organisation. Lean leadership is an integrated part in the concept of Lean and is an important part in the management system. According to Lean leadership, leaders should continuously challenge their own and others' work, encourage employees, strive for improvements and development. Olsson and Hellsmark (2012) conducted a quantitative study on small- to medium sized manufacturing companies in Sweden. The study revealed that companies that have implemented Lean improved their economic performance over a four year period, compared to reference companies which did not work with Lean. However, the economic performance of these companies depends on how well the principles in Lean were carried out. The study showed that Lean changed capacity utilization, quality of products, the ability to adjust to rapid changes in the market and increased the overall economic performance.

For many agricultural firms, management skills may enhance the opportunity of improved profitability and efficiency (Rougoo *et al.*, 1998). Since Lean may facilitate and improve structure of the leadership and improve the efficiency there may be a value for agricultural firms to implement Lean (Berglund *et al.*, 2011). According to Dyrendahl & Granath (2011) Lean is useful for agricultural firms. Their study showed that agricultural firms have a potential to increase profitability with 5.6 percentages by using Lean. Currently, there is a project in Sweden to implement Lean in agricultural businesses (www, Leanlantbruk, 2013). The project is labelled *Lean lantbruk* and aims to improve competitiveness, resource

efficiency and continuous improvement in Swedish agriculture. The goal is to improve profitability and increase market shares. The main idea of the project is to introduce Lean to 100 agricultural firms by providing education, coaching and support from qualified Lean coaches. The project is driven by Hushållningssällskapet Halland and LRF.

1.2 Problem

Today, structural change towards larger units and more employees makes it difficult for the farmer to manage and observe every process in the daily operation (Berglund *et al*, 2011). Hence, the ability of the farmer to communicate and delegate responsibility to employees is of substantial importance. It is shown that continuous work with *motivation* and *commitment* among employees may improve the productivity and thereby the profitability (Berglund, 2010; Appelbaum *et al*, 2000). Commitment can be described as an interest or an involvement in an idea or project. In general, a high level of commitment implies focus on a specific task, a willingness to improve results and work towards common goals. Herzberg (1959) defines motivation as the level of job satisfaction. When someone is motivated they have the motive to make an effort in order to reach a goal (Berglund, 2010).

As in other businesses, it is a challenge for agricultural managers to encourage employees to work with continuous improvements and integrate the Lean principles in the organisation (Berglund *et al*, 2011). The experience of managers and employees is that only a small portion of the workforce is enthusiastic in participating in decision-making and problem solving (Vidal, 2007). For the majority the opportunity of decision-making and problem solving is less important than job security, communication from management, interpersonal relations and predictability at work. This may be an issue, since it is vital to involve everyone in the organisation when integrating Lean principles.

The problem background of this thesis shows that *i*) the competitiveness in Swedish agricultural companies must improve, *ii*) farms undergo structural changes towards larger units *iii*) Lean is one way to work with leadership and improve overall performance for a company (Ekman & Gullstrand, 2006; Berglund *et al*, 2011; Ulvenblad *et al*, 2013; Liker, 2004; Olsson & Hellsmark, 2012). The first point refers to that Swedish agriculture finds it difficult to achieve long-term profitability. The second point with larger farms implies that farms will operate with more employees, which requires management skills. This is a challenging situation that some farmers may not be familiar with. The third point implies that Swedish agricultural businesses may improve their overall performance by implementing Lean as a management system. Lean may be a strategy for leaders to reduce costs for the agricultural firms (Achanga *et al*, 2005). In every organisation it is fundamental to reduce costs in order to survive long-term.

Lean leadership can facilitate farm managers' development in an increasingly complex environment. By developing these leaders, there may be an increased chance for enterprises to survive to the benefit of future generations. Lean leadership can be a tool to create and structure work routines as well as lead the agricultural firm. The management system, with written routines and experiences, may minimize risks, improve commitment and increase motivation amongst employees. It is evident that farm managers need to communicate, encourage and support employees to build a Lean organisation. Lean can be a failure, that is if the leader fails to integrate Lean's principles in the daily operation or does not succeed in encouraging employees to work with Lean. Therefore, it is of interest to examine to what extent Lean leadership in *Lean lantbruk* may contribute to the development of agricultural

firms. There are numerous studies on Lean and leadership, but none of them investigates outcomes in an agricultural context. Kemp *et al* (2004) made a study in Australia which revealed the importance of management skills in agricultural firms. Hence, this study differs from previous literature since it focuses on Lean and leadership in agricultural businesses, which according to the best of the author's knowledge has never been done before. The research contribution of this study is therefore of high relevance.

1.3 Aim

The aim of this study is to explain how agricultural firms can use Lean as a way to work with leadership, by evaluating indicators which have potential to make Lean leadership successful.

The research questions are formulated as follows:

- What leadership skills are central in Lean leadership for agricultural firms?
- What are the occurring changes in agricultural firms, as a result of introducing Lean leadership? Such as: Working structure, working environment, motivation and communication.
- What is required of the leadership in order to sustain with Lean in Swedish agricultural firms?

In this case, success or successful implies to what extent the goals with Lean in accordance with Lean leadership theory are achieved given the perspective of the subjective assessment from leaders, employees and Lean coaches. The use of "sustain" in this contexts means to provide continuity in the Lean process.

The intension of this study is to provide support to future leaders within the agricultural sector to facilitate the implementation of Lean. The study primarily targets agricultural managers and agricultural consultants. Nevertheless, the study is of interest to the agricultural industry, researchers of Lean and decision makers.

1.4 Delimitations

The project is a case study of one particular industry; the agricultural based industry. The empirical study is limited to six agricultural firms in one Swedish county, Halland. At each firm the interviews are limited to one manager, one employee and their Lean coach. Comparing with previous studies 18 interviews and six case studies are sufficient. The theoretical framework is based on the concept of leadership according to Lean. Other leadership theories are presented but are less relevant to analyse, since such theories do not provide an equally clear link between the specific aim of this study and empirical data. The method of this study provides more detailed motivations of delimitations.

Another limitation in the study is the methodology. The study is performed as a case study on agricultural farms. The selections of interviewed were made in collaboration with Hushållningssällskapet Halland, who is leading the project *Lean lantbruk*. The analysis of the financial outcome of Lean leadership is limited, since the financial reports for 2013 were not yet finished.

1.5 Outline

The outline for this project is illustrated in figure 1. Chapter one presents the problem background, the problem, delimitations and the aim of this study. In chapter two, a literature review of Lean is given, which includes an introduction of Lean, a definition of leadership, arguments for implementing Lean, the importance of Lean leadership and critiques of Lean. The theoretical framework of this study is described in chapter three. Chapter four presents the method, which describes the research design, case study, review of theoretical framework, the collection of data, data analysis and ethical considerations. In the fifth chapter, the empirical data from the case study is presented. In the analysis and discussion in chapter six, the empirical data and theory are discussed and analysed. Chapter seven presents conclusions from the study as well as identifies future research areas.

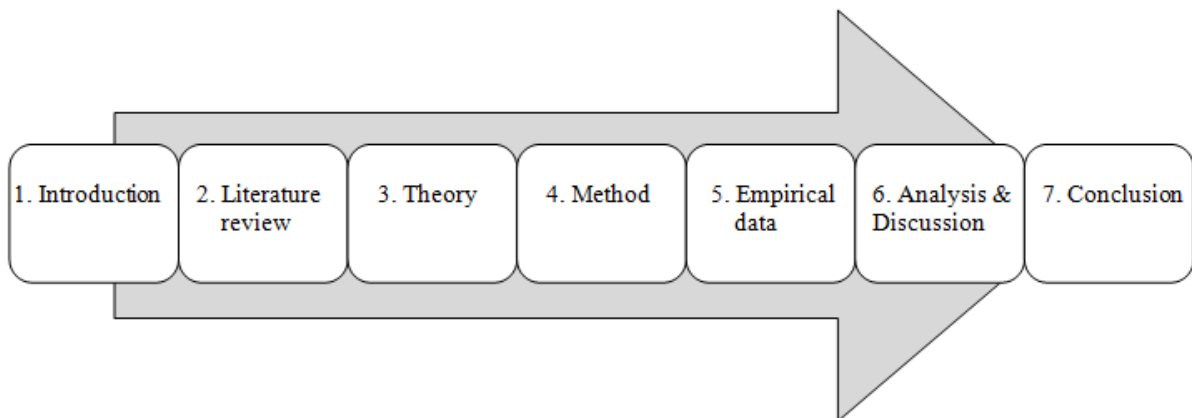


Figure 1. Outline of the thesis (own modification).

2 Literature review

Chapter two presents a literature review, where the reader is given an introduction of Lean. The chapter also includes a definition of leadership, review of why implement Lean, the importance of leadership and critics to the management system.

2.1 Introduction to Lean

In Japan after the Second World War, Toyota was facing an intense domestic competition and scarcity of resources (Liker, 2004). In order to improve efficiency in the company, Toyota's managers started studying mass producing companies in US. They found out that even though the companies were rather efficient, there were many deficiencies in the mass production. For example, storage was inefficient and kept at a too high cost. Furthermore, the mass production did not pay attention to customer needs and was not customer oriented. They realized that the production systems in US could not be copied. The capital cost was too high and the company had to adjust to the Japanese market. However, influenced from studies of mass production, Toyota started to develop Toyota Production System, TPS.

TPS eliminates actions that do not create a value (*ibid*). The management system is mapping value-streams and focus on what is value-adding for customers. TPS has evolved during decades (*ibid*). The system was first spread to Toyota plants, followed by an implementation at the suppliers. Researchers at Massachusetts Institute of Technology became interested in TPS and the way Toyota worked (Womack *et al*, 2007). The researchers started to use and interpret the philosophy. In the western world the term of this philosophy is called Lean.

2.1.1 Defining Lean

There exist many definitions of Lean, yet researchers and practitioners have not agreed upon or decided on a common definition (Shah *et al*, 2007, Liker, 2004). In general, there are two perspectives, one philosophy and one practical point of view (Shah *et al*, 2007). Womack *et al* (1990, p. 13) stated:

“Lean uses half the human effort in the factory, half the manufacturing space, half the investment in tools, half the engineering hours to develop a new product in half the time. It requires keeping half the needed inventory, results in many fewer defects, and produces a greater and ever growing variety of products”.

Lean thinking differentiates between *value* and *waste* (Stone, 2012). Womack *et al* (1996) define value as *“a capability provided to a customer at the right time at an appropriate price, as defines in each case by the customer”* (p. 311). Waste is defined as *“any human activity which absorbs resources but creates no value”* (p. 15). According to Toyota there are four main values; philosophy, processes, people and problem solving (Liker, 2004). The values are illustrated in figure 2.

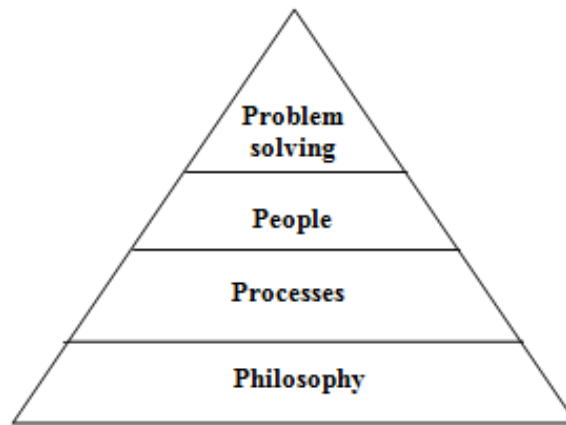


Figure 2. “4P” model according to Toyota (own modification of Liker, 2004).

The philosophy is the bed-rock of the pyramid, which is long-term and integrated in the whole organisation (*ibid*). The next level is processes and refers to eliminate waste. The third level in the pyramid is the people which include both employees and partners. The people should continuous be challenged, treated with respect and grow. The top of the pyramid includes problem solving and continuous improvements. Liker uses the four P’s to develop the 14 principles. The principles are given more thoroughly in appendix 2.

“Philosophy

1. *Base your management decisions on a long-term philosophy, even at the expense of short-term financial goals.*

Processes

2. *Create a continuous process flow to bring problems to the surface.*
3. *Use "pull" systems to avoid overproduction.*
4. *Level out the workload.*
5. *Build a culture of stopping to fix problems, to get quality right the first time.*
6. *Standardized tasks and processes are the foundation for continuous improvement and employee empowerment.*
7. *Use visual control so no problems are hidden.*
8. *Use only reliable, thoroughly tested technology that serves your people and processes.*

People

9. *Grow leaders who thoroughly understand the work, live the philosophy, and teach it to others.*
10. *Develop exceptional people and teams who follow your company's philosophy.*
11. *Respect your extended network of partners and suppliers by challenging them and helping them improve.*

Problem solving

12. *Go and see for yourself to thoroughly understand the situation*
13. *Make decisions slowly by consensus, thoroughly considering all options; implement decisions rapidly*
14. *Become a learning organisation through relentless reflection and continuous improvement.”*
(p 37-41).

2.2 Definitions of leadership

There are numerous definitions of leadership. Robbins and Coulter (2009) define leadership as what a leader does. Northouse (2007, p. 5) stated “*leadership is a process where an individual influence a group of individuals to achieve a common goal*”. In Selznick book from 1957, the author writes that: “*leadership sets goal, but in doing so takes account of the conditions that have already determined what the organisation can do and to what extent it must do*” (p. 62). Bodek (2008) makes a distinction between a manager and a leader. The

manager looks at the past and determines what to do in the future, while a leader sets a vision of what is possible to do in the future.

2.3 Review of Lean

This section gives a literature review of arguments to implement Lean, the importance of leadership and critics of Lean.

2.3.1 Why Implement Lean?

Womack *et al* (1990) revealed that car assembly plants in Japan had two times higher productivity than western companies. The performance differential was due to Lean practices, which reduced lead times, staff and material costs as well as increased quality. Moreover, in Japan the level of service rate was 98 percent in 2 hours, while it took 7 days in US to achieve the same level (Womack *et al*, 1996). Lean reveals that same level of output may be achieved with less input, which is positive for the overall business performance (Lewis, 2000).

Lean advantages relate to three key principles *i*) improving the flow of information and material across value-streams, *ii*) an emphasis on customer- demand and orientation as well as *iii*) a commitment to continuous improvements enabled by the human capital (Womack *et al*, 1990). Lean's emphasis on "perfection" through continuous improvements may deliver sustainable competitive advantages (Lewis, 2000). In Lewis case study, two of the companies improved their operational performance and the inventory process decreased with 60 respectively 46 percent. Another company experienced volume- and profit growth with 92 respectively 233 percent. Womack *et al* (1996) found that a company could cut its storage area with 25 percent and by freeing capital the company could make revenue-producing investments.

Berglund (2010) showed that Lean created a higher motivation and communication in an organization. Abrahamsson *et al* (2013) showed that Lean can improve working environment, since Lean provides a new way of thinking. There are several examples where Lean has created an improved working environment and working structure (Hunter, 2008; Brulin, 2003; Saurin & Ferreira, 2009).

2.3.2 The Importance of Leadership in Lean

There is complexity when implementing Lean, since there are many people involved (Balmer-Hansen *et al*, 2013). In general, the challenges are that the management does not allocate enough time to development, the measurements are not used in the correct way and the effects of the work of improvements are not visualized in the economic performance. More challenges are to make everyone involved and to have straight connection between goals and work of improvements. A common pitfall is to always prioritizing the daily operation before the work of improvements and that there is lack of understanding of the cross flow value stream. These issues stress the importance of leadership. Furthermore, Bodek (2008) argues that without leaders no company can sustain a Lean initiative.

There are five fundamental foundations to succeed as a leader (Balmer-Hansen *et al*, 2013). The five foundations are to give directions and create meaning, understand the value streams, act out of measurements, take advantage of the benefits and create commitment. The first foundation refers to create a vision and strategic goals on all levels in the organisation. It is of importance to establish guidelines in order to support the daily operation for managers and employees. Understanding the value streams require knowledge of the daily practical work from the top management. By such understanding improved strategic guidelines can be

established and it easier to acknowledge improvements. The third foundation refers to the importance of acting based on measurement. Without measurements, decisions may be made too late and it will be difficult to achieve the set strategy. The fourth strategy refers to that organisations should take advantage of achieved benefits. The top management, leaders and employees must visualize the result from work of improvement. Visualized achieved results, is a way to encourage working with continuous improvements. The last and fifth foundation refers to the importance of involvement and commitment. The top management has to involve everyone in the process of implementing Lean, since the performance is determined by involvement.

In the study conducted by Howison (2009) the positive effect was that Lean created more informal teams and a “smarter workforce”. The individual willingness to adapt Lean principles both from managers and employees determine to a substantial extent the outcome (Vidal, 2007). It is important that informal leaders advocate the management system, since they can convince others to work towards the same goal.

Mann (2009) argues that there is missing link and a division between Lean tools and Lean thinking. Lean thinking refers to the philosophy and Lean tools are associated with ways to improve manufacturing. Lean management is the bridge between those critical divisions. A Lean initiative that does not sustain and deliver improvements is due to a leadership failure. A sustained Lean performance requires a discipline Lean management approach. Mindset and behaviour among leaders and then gradually throughout the organisation must sustain to Lean thinking. Eventually, striving for perfection will make a Lean culture grow. Achanga *et al* (2005) identified several critical factors that determine the success of a sustained Lean implementation within small and medium sized enterprises (SME's). Their study revealed that leadership, management, skills and expertise amongst other factors are the most pertinent issues critical for a successful Lean implementation within SME's environment.

2.3.3 Critics of Lean

As Lean has evolved during time, critics have found various gaps in Lean thinking (Hines *et al*, 2004). Key factors in this criticism are the lack of consideration of human aspects, narrow-operational focus on the shop floor, ability to deal with variability and lack of contingency.

Williams *et al* (1992) argue that Lean is exploitative and de-humanizing. Their and similar studies raise an important point for those who want to apply Lean thinking, namely that Lean should be viewed as more than a set of techniques and mechanic tools (Hines *et al*, 2004). The human dimensions of respect for people, empowerment and involvement are vital for a long-term sustainability, regardless of industry. Howison (2009) found that workers in the production were concerned that Lean attacked the privileges associated with seniority. Senior workers lost their privileged position due to Lean's principle of job rotation. Vidal (2007) also experienced that senior workers have difficulties to adapt the Lean principles and that it had negative effect on job stress and satisfaction. In addition, several workers in the study by Howison (2009) thought that some managers lacked in ability to take improvement suggestions seriously. They also experienced unwillingness from the management to adapt the empowering aspect in Lean. Some of the principles in Lean, especially those which are associated with Just-in-Time and standardized work may lead to negative working conditions (Berglund, 2010). Lewis (2000) study showed that a Lean organisation is more vulnerable since such a company depends to a substantial extent on key workers. When other companies are headhunting and offering substantial wage increases, small organisation will struggle to replace these key workers.

Many executives are thinking in terms of the traditional industrial organisation (Berglund, 2010; Hines *et al*, 2004). They have lack of knowledge, will and scope of action to use the soft factors in Lean. Soft factors in Lean are for example respect for people, decisions in agreement and long-term thinking.

Lean has expanded beyond its original application (Hines *et al*, 2004). Different industries have different ways to deal with variability and volatility in demand. Sectors outside the high-volume manufacturing environment can have difficulties in using Lean. Doolen and Hacker (2005) conducted a study on Lean practices by electronics manufacturers. The study revealed that type of manufacturing and size of an organisation are significant factors when using Lean.

2.4 Summary of literature review

In this section a summary of the literature review is provided. Introduction to Lean provides a background and a definition of Lean as a management system. The section is aiming to give an understanding for Lean. In the next section a definition of leadership is provided. The last section gives a review of Lean. Why implement Lean gives examples of possible outcomes from the management system. The importance of leadership in Lean shows success factors and difficulties associated with Lean leadership. Furthermore, the section highlights the importance of leadership. Other aspects such as profitability, innovation and growth are not taken into account, due to the aim of this study. In the last section critics of Lean are given, since it is of importance to have a critical point of view as well when analysing empirical data. Review of Lean is critical in order to gain a deeper understanding and increase the ability to analyse the result of the study. The key concepts that are relevant for the purpose of this study are presented in table 1.

Table 1. Summary of literature review.

		Key concept	Key references
Introduction of Lean	Background	<ul style="list-style-type: none"> Developed in Japan to improve efficiency. Referred to as TPS. 	Womack <i>et al</i> , 2007 Liker, 2004 Convis & Liker, 2012
	Defining Lean	<ul style="list-style-type: none"> No agreed or decided common definition. Four main values; problem-solving, people, processes and philosophy. Liker's 14 principles. 	Womack <i>et al</i> , 1990 Stone, 2012 Womack <i>et al</i> , 1996 Liker, 2004
Definitions of leadership		<ul style="list-style-type: none"> There are numerous definitions of leadership. There are a distinction between managers and leaders. 	Robbins & Coulter, 2009 Northouse, 2007 Selznick, 1957 Bodek, 2008
Review of Lean	Why implement Lean?	<ul style="list-style-type: none"> Evidence of higher productivity, reduced lead time and higher quality. Three key advantages; commitment to continuous improvement, improved flow of information and more customer oriented business. Improved communication, working structure, motivation and working environment. 	Womack <i>et al</i> , 1990 Lewis, 2000 Olsson & Hellsmark, 2012 Doolen & Hacker, 2005 Berglund, 2010 Hunter, 2008
	The importance of leadership in Lean	<ul style="list-style-type: none"> Without leaders no company can implement Lean principles. Success factors for a leader; give directions and create meaning, understand value-streams, act out of measurements, take advantage of benefits and create commitment. Lean leadership is the bridge between Lean tools and Lean thinking 	Balmer-Hansen <i>et al</i> 2013 Bodek, 2008 Mann, 2009
	Critics of Lean	<ul style="list-style-type: none"> Lack of human aspects Narrow-operational focus on shop floor Low ability to deal with variability and lack of contingency 	Hines <i>et al</i> , 2004 Williams <i>et al</i> , 1992 Berglund, 2010

3 Theory

In this chapter Lean leadership theory is presented. This theory is relevant for the aim of this study and is discussed together with empirical data in the analysis. Furthermore, the chapter includes a description of situational leadership and transformational- and transactional leadership. The last section is this chapter motivated choice of theory.

3.1 Lean leadership

In this section, leadership theories according to Lean are given. The section starts with a description of the core values and is followed by a presentation of the leadership development model. Lean leadership is one part of the Lean theory and is relevant, due to the aim of this study.

3.1.1 Core values

According to Toyota, Lean leadership means continuous leader development (Convis & Liker, 2012). The main focus is to strive for improvements in the leadership and hereby, develop the organisation. The core values in Toyota are vital when understanding the company's approach to leadership. Toyota is truly committed to its core values and it is of importance that everyone lives up to these values. *True North* is the ideal stage according to Toyota, this can be achieved by *challenge*, have a *Kaizen thinking*, *Genchi genbutsu*, *teamwork* and *respect for people*. Each of the terms are described more thoroughly below.

True North

The ideal stage called True North is when all resource inefficiencies in an organisation are eliminated (*ibid*). True North provides a stable direction to what the company should be aiming for. The direction or vision does not change from year to year. It is ensuring that leaders and everyone are working with continuous improvements. It is a symbol that should incuse everyone within the organisation.

Challenge

Leaders should take the challenges to reach a vision with enthusiasm and energy (*ibid*). The core value aims to energize leaders to strive for perfection. Every leader can improve by increasing the difficulty in every challenge and carefully reflect. Once a goal is achieved, a new challenge should be taken.

Kaizen Mind

Kaizen thinking or kaizen mind means to have a mindset where everything is in disarray and nothing is perfect (Shimokawa *et al*, 2009). This mindset is crucial to every leader and by thinking this way, there will always be room for improvements (Convis & Liker, 2012). If every process is perfect, no improvements can be made and the organisation will not develop.

Genchi Genbutsu

Genchi genbutsu, or *go and see*, refers to how leaders make decisions (*ibid*). Leaders are expected to have knowledge of any issue that is in their charge by go and see for themselves in the production. The root cause to a problem is otherwise difficult to identify and solve. Before taking a decision it is of importance to gather information and understand the situation. Decisions based on facts avoid unproductive discussions and may lead to effective solutions. Moreover, there is a substantial value for employees to acknowledge the leaders in the production (Shimokawa *et al*, 2009). The leaders can also actively acknowledge improvements, make changes and find out what needs to be done in the production.

Teamwork

In Toyota individual success can only be achieved when teamwork is successful (Convis & Liker, 2012). Teamwork benefits from personal growth of individuals, but individuals are only small components in the incentives for performance. Teamwork is dominating in incentives of performance and team based rewards are deep rooted in Toyota (Liker, 2004).

Respect for people

A fundamental core value is to have respect for people (Convis & Liker, 2012). Respect for people means a true desire to provide the society with the best products and services on the market (Shimokawa *et al*, 2009). The respect for people involves respect for customers, employees, business partners and community (Convis & Liker, 2012). It is of respect to people that Toyota produce and sell locally and have made substantial commitments to economic and social well-being communities. The core value also led to large investments in developing environmental friendly technology.

3.1.2 The Toyota Way Leadership Development Model

The core values are the bedrock in the leadership of Toyota (*ibid*). However, the company has created a systematic way to develop and identify leaders by the Diamond Model of Lean Leadership Development. The model is shown in figure 3.

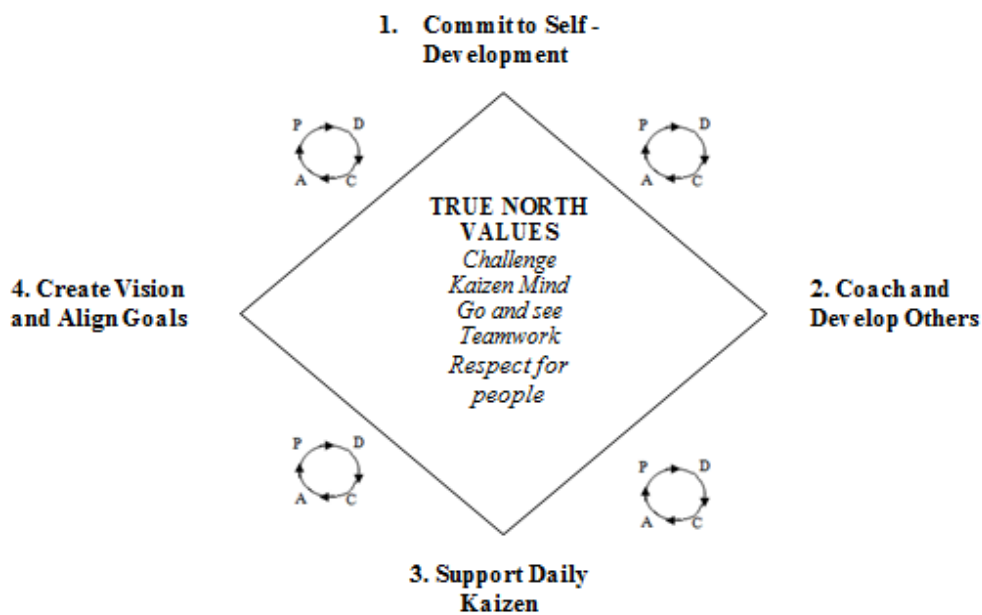


Figure 3. The diamond model of Lean leadership development (own modification of Convis & Liker, 2012).

The leadership model is cyclical, repeating throughout a person's career (*ibid*). The model is based upon the Plan-Do-Check-Act cycle (Durward *et al*, 2008; Liker, 2004). Plan refers to establish a process to improve a target. Do means to implement the plan and Check refers to control the outcome. The last step is act, meaning to correct actions and act from experience. The model is in a logic sequence, which starts with self-development before developing the whole organisation to align goals (Convis & Liker, 2012). Self-development and development of others are important before being able to create a common culture within the organisation. A more detailed description of each step is given below.

1. Self-development

The first step in the leadership development model is self-development (*ibid*). In this first step, Toyota identifies people who have the potential to become leaders. Toyota argues that some people have more ability and potential than others to become a leader. Nevertheless, leaders have to become taught to be leaders. The style of Toyota leadership is to be dedicated to continuous improvement, which is a never-ending process. Only people who show capacity and drive for self-development are allowed to go to the next step.

Toyota stresses importance to let a student think for him/herself, take responsibility and use “learning by doing” (*ibid*). However, the teacher provides support when a student is carrying out his/her tasks. There is a jointly responsibility between the student and the teacher. The student has to deliver results and strive for self-improvement, at the same time as the teacher has to reflect and give feedback. Central skills for Lean leadership are given below.

- “Achieve and open-minded observing of the work of the organisation.
- Achieve listening to hear what people are really saying
- System thinking
- Understanding the actual strengths and weaknesses of each person
- Clearly defining problems and identifying the root cause
- Planning
- Creatively identifying counter measurements to the true root causes
- Translating plans into action with clear accountability
- Taking the time and energy for deep reflection to identify further opportunities for improvement
- Motivating and influencing people across the organisation (with no direct authority) toward common objectives
- Being able to teach others all of the above” (Convis & Liker, 2012, p. 67).

There are five dimensions to reach self-development: standardization, guidance from the teacher based upon observations, on-the-job development, stepwise increasing challenges and no answers from the teacher (*ibid*). By not giving the student answers the student has to deeply reflect. This learning method is called *hansei* and means reflection. It is a conscious process of looking back and learning from what has happened. It is crucial to divide parts into what went well and what could have been done better.

2. Coach and develop others

The second step of the diamond leadership model is to coach and develop others (*ibid*). Toyota has the philosophy that “you develop by teaching others”. By develop people through coaching and teaching creates opportunities for improved results. A way to motivate employees is to empower, implement job rotation and provide feedback (Liker, 2004). Liker uses a two-dimension matrix of leadership. The matrix characterizes Toyota leadership and compares it with other companies. An organisation can be managed from top-down or from the bottom to the top. A management from the bottom to the top gives employees the opportunity to make decisions. The second dimension in the leadership matrix is general management expertise and deep understanding of work. A bottom-up leadership may either be called “group facilitator” or “builder of a learning organisation”. A group facilitator encourages and develops employees but has no deeper understanding in leadership. A builder of a learning organisation has a deep understanding of the daily work and has ability to encourage and develop employees. A top-down management can be characterized by a bureaucratic manager and a task manager. The bureaucratic manager is least efficient and has

only general knowledge of leadership. This management is based on following rules. The task manager has deep understanding of the daily work, but is less likely to empower employees. The matrix is illustrated in figure 4.

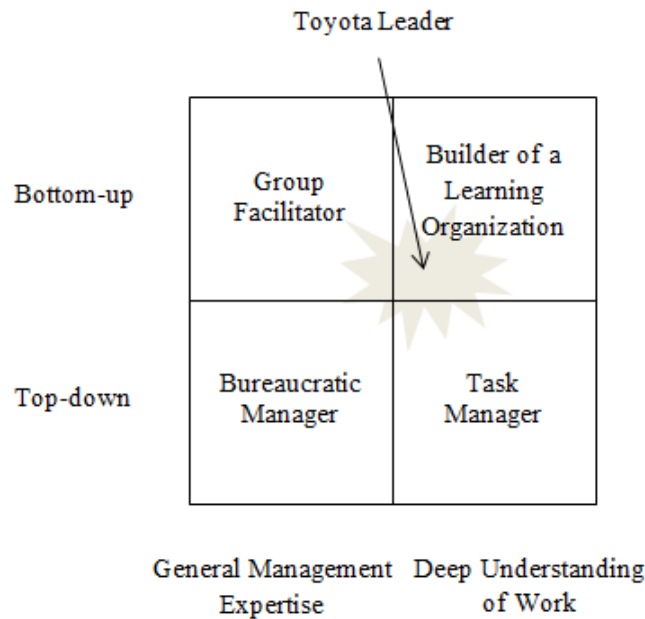


Figure 4. Toyota’s leadership matrix (own modification of Liker, 2004).

Toyota leadership can be found to various extents in all of the different types of leadership (*ibid*). At the right place and at the right time all types of leadership have a function. However, Toyota leaders’ primary task is to build a learning organisation.

Toyota has a consistent organisational structure, although the number of levels may vary in different locations (Convis & Liker, 2012). The company has a hierarchical organisational structure. They believe that a flat structure is more costly. Usually a flat structure implies that one leader is in charge for 15 or even more people. Toyota has a goal of approximately one leader for every five employees. Hereby, the teacher can provide coaching and support in order to have an efficient development process of employees and leaders. With a close attention, employees and leaders are more likely to find the root of the caused problem and waste can be eliminated. The hierarchy in Toyota is turned upside down, with the team members at the top since they are the most important people. The leaders have to prove that they have a value by supporting and helping team members to perform. This can be illustrated as a pyramid and is shown in figure 5.

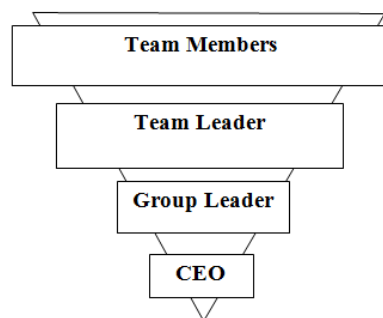


Figure 5. Hierarchy of positions at Toyota (own modification of Convis & Liker, 2012).

3. Support Daily Kaizen

The third step in the leadership model is to support daily kaizen (*ibid*). Daily kaizen is the support in the daily operation where leaders use standards, targets and visual management. Daily kaizen is an integrated part in the leadership of Toyota. There are two types of kaizen; improvement- and maintenance kaizen. Maintenance kaizen refers to the daily work to live up to expected standards and deal with mistakes, deviations and breakdowns. The target is to bring back the production to the standard and bring problems to surface. Improvement kaizen refers to raising the bar of standards. The goal is perfection and there are always processes to improve. The leaders' role is to continuously adding energy to the improvement process. It is a long-term challenge to work with kaizen.

Team leaders begin their career as team workers and by performance they become promoted to team leader and then group leader (*ibid*). Group leaders are vital in Toyota since they have substantial influence on team members. They play a linking part by communicating results, align goal, policies, develop team members and provide resources for the team members. Moreover, the group leader has a position to discover wastes and eliminate these.

Lean cannot be achieved without kaizen and kaizen is dependent on team members and their performance (*ibid*). Real kaizen only happens when team members own their process and group leaders support and provide guidance. Toyota leaders develop understanding for kaizen by first self-development and then by coaching and developing workers.

4. Create Vision and Align Goals

A vision and a set of targets are important in every business (*ibid*). At Toyota this is critical since the leadership is centralized to "True North". Toyota is using *hoshin kanri* to coordinate directed actions in the organisation. *Hoshin* means, "pointing the direction" or "compass". *Hoshin* refers to annuals plans and targets for the company, while *kanri* is the term of "control" or "management". *Hoshin kanri* is the process of formulating goals, but also a concrete plan of how to reach those goals. The goals are formulated in agreement and are a collaborative process with employees.

Hoshin kanri is securing that the improvement process is developing in the right direction (*ibid*). Goals formulated by the top executives are broken down into sub-goals and are integrated down into the whole organisation. From this suggestions of improvements can be made.

Hoshin kanri is a cyclical process, which starts with a long-term corporate vision (*ibid*). The typical vision has a ten-year time horizon. In order to reach the vision a five-year business plan is set. The business plan is broken down into annual plans, which are adjustable throughout the year. At the end of the year, annual plan is reviewed toward the ten-year vision and a new annual plan is set based on prior experience and future expectations. A plan is set up at a high level and then broken down into smaller pieces, followed by doers which execute the plan. Improvements are checked on each level and depending on the outcome further actions are taken.

3.2 Alternative leadership theories

Alternative leadership theories may be used to analyse the research questions. In this section, situational leadership and transformational- and transactional leadership theories are presented.

3.2.1 Situational leadership

There is not only one leadership behaviour that fits in every situation (Hersey & Blanchard, 1993). The leader has to adapt continuously to different situations. Situational leadership refers to what type of leadership that should be used in a specific situation. Type of leadership depends upon the maturity of the followers. By maturity, meaning the ability of a person to perform a specific task. The maturity is divided into two sections; ability and willingness. Willingness targets a person's or a group's involvement, motivation and self-esteem. Ability targets experience, knowledge and skills.

Hersey and Blanchard (1993) define four types of leadership, which is paired together with the right level of maturity. Delegating, coaching, supporting and directing leadership are the four types and are shown in figure 6.

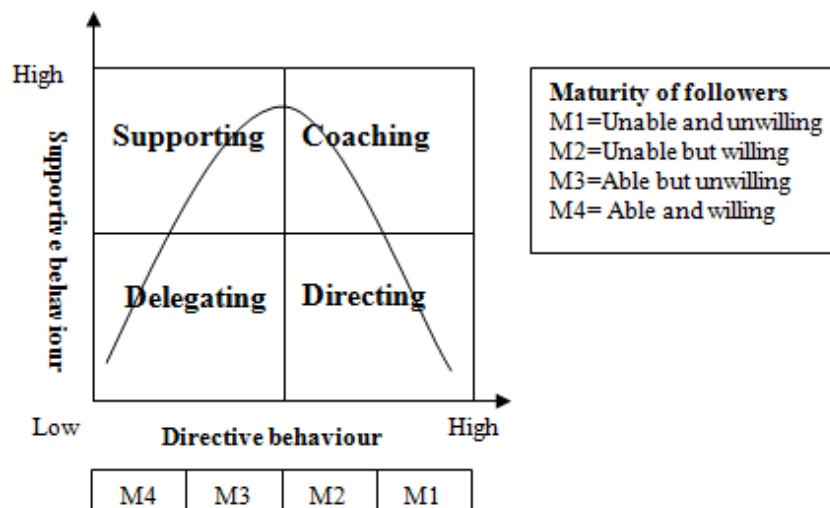


Figure 6. Situational leadership model (own modification Hersey and Blanchard, 1993).

3.2.2 Transformational- and transactional leadership

Transformational leaders are ends- and outcome oriented (Bennis, 1984). They are inspirational, encourage others and build trust (Dubrin, 2010). The leadership place high emphasis on new frontiers, creativity, values, cooperation and integrity (Selznick, 1957). A transformational leader is charismatic and creates a vision (Dubrin, 2010). Moreover, such leaders give supportive leadership, by providing positive feedback to develop its followers. The leaders are empowering team members and involve these in decision making. Innovation and challenging tasks are continuously provided by a transformational leader.

Transactional leaders are process- and means oriented (Burns, 1978). They think in terms of replicability with a focus on accountability and control (Bennis, 1984). The leadership is based on routine transactions and is rewarding when standards are met (Dubrin, 2010). Transactional leaders prefer security and are efficient where they can control deviation from set norms (Kouzes & Posner, 2002).

3.3 Summary of theories

According to the theories presented above there are different ways to evaluate, describe and define leadership. A short summary of every theory is presented in table 2.

Table 2. Summary of theories.

Theory	Description	Key references
Lean leadership	Lean leadership relies on <i>core values</i> that should be fundamental when working with Lean.	Convis & Liker, 2012 Liker, 2004 Shimokawa <i>et al</i> , 2009
	Lean leadership is based on the leadership development model. It is a circular process including four stages: <i>self-development, coach and develop others, support daily kaizen and create vision and align goals.</i>	
Situational leadership	The leader should continuously get adjusted to different situations. There are four types of leadership: <i>delegating, supporting, coaching and directing.</i> Type of leadership depends upon the maturity of the followers.	Hersey & Blanchard, 1993
Transformational- and transactional leadership	Transformational leaders are ends- and outcome oriented. Transactional leaders are process and means oriented.	Bennis, 1984 Dubrin, 2010 Burns, 1978 Kouzes & Posner, 2003

3.4 Choice of theory

The aim of this study is to explain how agricultural firms can use Lean as a way to work with leadership, by evaluating indicators which have potential to make Lean leadership successful. Given the research questions this study chooses to use Lean leadership theory to analyse the empirical data. The other leadership theories do not provide an equally clear link between the research questions and the empirics. Therefore, theories containing situational leadership and transformational- and transactional leadership are excluded from the analysis and discussion. It may be acknowledged that Lean leadership theory only provides one type of leadership and there is no evidence that Lean leadership theory is the only optimal theory to explain leadership. However, the agricultural firms have implemented Lean and it is highly relevant to use Lean leadership theory to answer the research questions in this context.

4 Method

In this section the set of choices for the research design within the study is presented. Moreover, the section explains and motivates the research project.

4.1 Research design

Fixed and flexible designs are two different ways to describe approaches to research design (Robson, 2011). Fixed design or more traditionally known as quantitative method, implies that the study is fixed before the main part of the data is collected. The design requires that the variables to be included in the study are specified in advance (Robson, 2002). The fixed design, decreases the risk that the researcher affects the results of the study. In other words, this method can minimize the extent to which the research is affected by the beliefs, values and expectations of the researcher. However, the approach demands long periods of preparation and substantial understanding of the studied project. A fixed design approach does not take into account the complexity of individual human behaviour (Robson, 2011). In a flexible design or qualitative method the data collection can evolve during the research process. Skills for a flexible design are that the process of data collection is described in detail and that multiple data collections are used. A central part of flexible design is to explain the reality. This requires an open-minded researcher who is a listener, has high responsiveness and lack of bias. Moreover, the skills of the investigator or researcher determine to a substantial extent the quality of the studied phenomenon.

This study employs a flexible qualitative method approach, since the aim is to explain indicators which have the potential to successfully work with Lean leadership in agricultural firms. In this particular study, the objective was to study six agricultural firms, their managers, employees and Lean coaches. In total, 18 interviews were conducted. The actual outcome was not determined in advance, which motivates the chosen method. Furthermore, the complexity of the research questions required a qualitative method, since the value of asking follow-up questions was high. Additionally, qualitative interviews enabled respondents to ask questions if something was unclear. Several researchers that are evaluating outcomes of Lean have also used a qualitative method with case studies (Lewis, 2000; Berglund, 2010; Vidal, 2007). A quantitative study with a questionnaire would eliminate the possibility of receiving further and more detailed information (Robson, 2002). That is why a quantitative method is not suitable for this study.

Since the study relies on “a researcher as an instrument”, the validity may be debated (Robson, 2002). Validity refers to that the empirical data is relevant and measure the objectives that should be measured. The presence of the researcher and his/her relationship with the respondents can have an influence on how they respond, which may interfere with the outcome of the study. The research bias of the researcher can include assumptions and prejudices, which may affect the kind of questions asked in an interview. Reliability in the flexible design is of substantial importance and refers to the consistency of a measure. A study with high reliability implies that another researcher has no problem to repeat the study and achieve the same result. In order to achieve a reliable study and avoid pitfalls, the researcher has to be careful and thorough. When conducting a qualitative study, there are advantages to have multiple investigators (Eisenhardt, 1989). Firstly, multiple investigators can enhance the creativeness of the study. Secondly, the confidence of the findings can increase, due to the fact that multiple investigators are observing a phenomenon. Thus, the

likelihood of interesting results increases since the case is being studied from more than one perspective. In this study, the researchers conducted the interviews and interpreted the results, with open minds in an effort to inflict no prejudices so that in the outcome of the study would not be affected. Throughout the study, the authors were trying to be careful and thorough to increase reliability. Since the study was conducted by more than one investigator, the confidence in the findings increased.

4.2 Case study

Yin (2009) states a “*Case study is a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiply sources of evidence*” (p. 18).

A case study approaches, is an essentially qualitative method (Robson, 2002). According to Bromley (1986), “*the individual case study or situation analysis is the bed-rock of scientific investigation*”(p. 352). Case studies can be carried out as a single or multiple (Robson, 2002). Holistic or single case studies involve one individual or can also be an institution, a group of individuals or an innovation. Multiple case studies or embedded design implies several individual case studies. Multiple case studies are not statistically generalizable, but sometimes it can be theoretically or analytical generalizable (Robson, 2011). The goal is not to count frequencies (statistical generalization), but to extend and generalize theories (analytic generalization) (Yin, 2009).

Preparing and carry out a case study with more than one investigator requires that everyone is involved in the process of formulating questions (Robson, 2002). Formulating research questions are important and time consuming (Yin, 2009). “How” and “why” questions are typically used in case studies and it is evident that these questions need a lot of preparation. It is also of importance that all investigators are involved in the development of the case study plan (Robson, 2011). In case studies, data can be combined and gathered through interviews, questionnaire and observations (Eisenhardt, 1989). A strength of a case study approach is that data can be collected from multiple sources of evidence (Yin, 2009). However, researchers have been concerned over the accuracy in case studies. There are many examples of case studies where the researchers have not followed systematic procedures and let biases affect findings and results. Researchers have also complained that case studies take too long of time and require a substantial amount of documentation. Although, recent research with case studies has proven that this does not necessarily need to be the case.

There are three examples of case studies: *explanatory, descriptive and exploratory* (Yin, 2009). Since, the purpose of this study was, to explain the indicators that have the potential to successfully work with Lean leadership, a descriptive case study with embedded design was used. A descriptive case study allows the researchers to explain and describe the situation in a real-world context.

Yin (2009) stresses the importance of defining “*the unit of analysis*”. In this study the unit of analysis was to explain the indicators which have a potential to make Lean leadership successful in an agricultural company. The study is relevant, since Lean has been recently implemented in Swedish agricultural firms and leadership in this context has not been evaluated. Moreover, profitability in Swedish agriculture is widely discussed and the agricultural sector needs to find ways to improve its competitiveness on a global scale. Since

Lean has shown improved profitability and competitive advantages, the results of this study may add value for future Swedish farmers.

An important issue in case studies is how many cases that should be included in the research project (Rowley, 2002). In general, six to ten case studies are preferred (*ibid*; Yin, 2009). Case studies that reveal a variety of different outcomes require further research. In this research project, six case studies were chosen, since they provide a deeper understanding of the studied phenomenon. Earlier studies on Lean have used similar amount of case studies. When Lewis (2000) conducted his qualitative interviews he used three cases. Vidal (2007) used nine cases for his qualitative study. Using six case studies are therefore reasonable and provide sufficient empirical data. Previous studies within Lean and leadership has used a similar methodology. Achanga *et al* (2005) explored critical factors for a successful implementation of Lean within manufacturing SME's. The study made a comprehensive literature review, visits to ten SME's and interviews with key personnel. Berglund (2010) identified how leaders through a Lean implementation can create motivation in an organization. He used three case studies of three manufacturing companies and interviewed leaders and employees. The two studies have almost the same methodological approach and explore a similar problem as this study, but within the manufacturing industry. Even if this study focused on agricultural businesses, the authors claim that the same methodology was possible and sufficient.

4.3 Review of theoretical framework and literature review

A central activity in conducting research is the development of theory (Eisenhardt, 1989). The volume of data can be overwhelming and therefore the development of theory requires a research focus. The unit of analysis and the choice of research questions are important in a case study (Yin, 2009; Eisenhart, 1989). Moreover, it is an essential part of the research design to develop a theoretical understanding. The theory development provides a deeper understanding of the studied phenomenon. In this case, it was essential to get an understanding of Lean and Lean leadership before conducting interviews and formulating an interview guide.

The theoretical framework was based on Lean leadership theory. This theory was relevant for the conducted study, since the agricultural firms have implemented Lean and uses the management system's tools. In order to evaluate indicators to successfully work with Lean leadership at these firms it was evident to use Lean leadership theory.

The study can be regarded as *deductive*, since the process started with establishing Lean leadership theory. The following step was to examine how well the theory fitted with the agricultural firms. A deductive process refers to a theory testing process and aims to see if the theory can apply to a specific case (Hyde, 2000).

Conducting a literature review is crucial when structuring relevant questions to investigate the operations or practices of agricultural firms. Collecting secondary data is important in order to gain a broader understanding for how other researchers have approached similar problems. The literature review is mostly based on literature from academic journals, textbooks and published articles. In the first phase of literature review, keywords for the literature search were mostly associated with *Lean, TPS and the definition of Lean*. In the second phase, central keywords included a *definition of leadership, Lean leadership and leadership theory*.

4.4 Collection of data

Real world research is about collecting data (Robson, 2011). The details of data collection are bound to the chosen methods of the investigation. Case studies and qualitative method are characterized by data from multiple sources (Yin, 2009). The data collection in this study used two major sources interviews and observations. Using multiple sources increase the validity of the data.

4.4.1 Interviews

Interviews are widely used as a research method (Robson, 2011). There are three types of interviews: *structured*, *semi-structured* and *unstructured*. Semi-structured is commonly used in a flexible research design. It is characterized by predetermined questions, but the order of the questions can be modified and there are opportunities to ask follow-up questions. The questions during the interview can change depending on the perception of what is appropriate.

Interviews are a flexible way of investigating a phenomenon (*ibid*). Face-to-face interviews offer the opportunity to understand underlying meanings and follow up on interesting responses. Nonverbal messages can be perceived and help to understand the verbal response. Nevertheless, it is difficult to completely ignore the effect of biases. Face-to-face interviews are time consuming compared to other interview techniques and require a substantial amount of time and preparation. Examples of things to avoid in an interview are to have too long of leading, jargon-based and biased questions.

In this project the interviews followed a semi-structured design, since the value of being able to ask follow-up questions was high. The study used face-to-face interviews, which increased the possibility to interpret answers that were not verbally spoken. The opportunity for respondents to ask questions if something was unclear reduced the risk of misunderstanding. It also increased the reliability and validity of the conducted interviews. Kvale (1997) suggests that the optimal number of interviews is between 5 and 25. The level of information from an additional interview, available time and geographical location are factors that determine the number of interviews. In this case, 18 interviews were conducted, which provided a deeper understanding of the research. However, this qualitative method does not provide any statistical generalization. A quantitative method with a larger number of respondents would enable a statistical generalization. The researchers experienced that the number of respondents were sufficient to receive a clear picture of the studied phenomenon. Interviews were conducted with employees, managers and Lean coaches to obtain different perspectives within different roles in each firm. Interviewing Lean coaches contributed with an external perspective. In table 3 the interview process is shown.

Table 3. Overview of the interview process.

Farm	1	2	3	4	5	6
Manager	2014-03-03	2014-03-04	2014-03-04	2014-03-05	2014-03-05	2014-03-06
Employee	2014-03-03	2014-03-04	2014-03-04	2014-03-05	2014-03-05	2014-03-06
Lean coach	2014-03-04	2014-03-04	2014-03-04	2014-03-05	2014-03-05	2014-03-13

The case studies were chosen from a list that Hushållningssällskapet provided. The list included 36 agricultural companies which introduced Lean in October 2012. All of the agricultural companies were participating in the project *Lean lantbruk* and were situated in Halland and Västergötland. The selected six agricultural firms were situated in Halland and represented dairy-, crop-, egg-, pig production and a nursery garden. This provides a

diversified point of view in the evaluation. The validity of the empirical data may be affected by similar attitudes in the same region and can be dissimilar in another part of the country. The choice of respondents was selected in collaboration with Hushållningssällskapet and so the selection may be viewed as biased. More critics to the choice of respondents are that selections of interviewed employees were made by leaders of the companies. Therefore there is a risk that leaders have chosen employees which were positive to Lean and its leaders.

Pre-testing of interview questions are important in order to know if the questions are clear and understandable (Robson, 2011). In this study pre-testing of the questions was conducted on two different firms. Both of the companies were in the manufacturing industry and have worked with Lean for at least a decade. Their knowledge and experience were valuable since they provided a deep understanding of Lean leadership. The pre-testing resulted in that the interview guide became revised and re-formulated. Moreover, the pre-testing provided a deeper insight of how to work with Lean leadership, including pitfalls and success factors. In the process of formulating questions, both investigators were involved. The design of questions was adapted to who was supposed to respond. The participants have been asked in advance if they want to participate in the study. Moreover, the questions aimed to support the interview. The interview guide intended to answer the aim of this study and relate the questions to theory. The interview guide is provided in appendix 1. Berglund (2010) supports the design of questions. In his study, he interviewed employees about their perceptions and experiences on Lean. The interview guide in this study was established by relating questions to different themes from the theory. These themes were *self-development*, *coach-and develop others*, *support daily kaizen*, *create vision and align goals* and *concluding remarks*. Sub-objective number one in this study was related to *self-development* in the theory section. Questions in the interview guide targeting leadership skills aimed to answer sub-objective number one. Sub-objective number two related to *coach and develops others* and *support daily kaizen*. Questions in the interview guide targeting occurring changes such as working structure, motivation, communication and working environment aimed to respond to sub-objective number two. Sub-objective number three was linked to all of the four themes in the theory section. Questions in the interview guide related to how Lean may be sustained in the agricultural firm provided answers to sub-objective number three.

All interviews started with a short presentation of ourselves and the aim of this study. The following questions were open questions about the interviewee targeting background and other personal information. The rest of the interview contained questions related to Lean leadership. The last question was related to “concluding remarks” which aimed to review the overall perception of Lean for Swedish agricultural firms. All interviews were recorded and transcribed, in order to reduce the possibility of misinterpretation. Each interview lasted approximately 30 to 45 minutes. The interviews were also validated by the respondents through a transcript and interviewees were kept anonymous. Kvale (1997) claims that anonymous respondents increase validity of data since incentives of giving true information is higher.

Reliability of a study is to a substantial extent determined by how well a later investigator can reproduce the study (Yin, 2009). Every procedure in a study must be described in order for another investigator to achieve the same result all over again. In this study the reliability is reduced since respondents are kept anonymous, which makes it more difficult to reproduce the study. However, the authors believe that the same result may be achieved when conducting a qualitative study with similar firms.

Berglund (2010) addresses the issues of misinterpretation of results and misunderstandings during interviews. In accordance with his study the researchers can not secure that results from interviews are not misinterpreted. However, the researchers have tried to address these issues and minimize the risk of receiving information that does not reflect the reality.

4.4.2 Direct observation

Observations are a natural and obvious technique to examine the real world context (Robson, 2002). A major advantage with direct observation is its effectiveness. Since no questions are needed the only requirement is to observe and listen. On other hand, there is a risk of interpreting a situation in the wrong way. Observations can be used as a supportive method to complement and set data in perspective. Its evidence is often useful in providing additional information (Yin, 2009).

In this project direct observation was an important contribution. The direct observations were used to validate and analyse the interviews. The observations were conducted during the interviews from impressions and insights. Moreover, the obtained observation provided a deeper understanding to the study.

4.5 Data analysis

A central part of a research project is the analysis of data (Robson, 2002). The analysis of empirical data should follow the objectives and theoretical propositions of the study (Yin, 2009). This study used a qualitative method, which typically contains a substantial amount of data from interviews and observations. The study used thematic coding to manage and structure the data. Thematic coding analysis aims to define what the data actually is about (Robson, 2011). In this study the first step was to transcribe all interviews and to become familiar with the data. In the second step the data was categorized according to the pre-determined themes. The data were structured and managed by focusing on one theme at the time. The different themes were *self-development, develop and coach other, support daily kaizen and create vision and align goals*. Moreover, the data was summarized and displayed in tables. The tables presented an overview of the connection between empirical data and aim of this study.

Thematic coding analysis can be applied to all types of qualitative data and is very flexible (Robson, 2011). Researchers with little experience of qualitative research may advantageously use it. Thematic coding analysis can summarize key features in qualitative data and its result can easily be communicated to an educated general public and practitioners. However, this analysis is based upon aspects which the researcher is deciding. Frequently, thematic coding is limited to exploration or description and leaves less room for interpretation. In this study thematic coding analysis contributed towards a clear structure, facilitated communication of the results and provided a deeper understanding of the problem.

4.6 Ethical considerations

There are numerous ethical considerations to take into account when conducting a research project (Robson 2011). It is vital at an early stage to acknowledge ethical aspects. For example stakeholders and other parties may be concerned about what is published and how it is reported. Moreover, researchers should anticipate and avoid consequences for the interviewee than can cause anxiety and harm (Oliver, 2010).

Before starting an interview it is of importance to inform respondents the aim of the study (*ibid*). In this project all participants were fully informed of the aim and how the study is supposed to be published. There are many ethical issues that may arise when researchers and respondents are interacting. The recorded data from the interviews raises an ethical issue. Therefore, the researchers carefully informed the participants that the interviews were recorded in order to be able to obtain all information. The participants were also informed that the recorded tape would be transcribed and then deleted. The interviewees were also given the opportunity to read and validate the transcribed material.

It was vital to interview employees, Lean coaches and leaders separately. Since, interviewing everyone at the same time would increase the risk of not getting their real opinions. Furthermore, it could make employees uncomfortable to express opinions about their leaders. In this study, privacy, confidentiality and anonymity were of high consideration, to avoid that respondents were affected in a negative way.

5 Empirical data

In the following chapter empirical data of the study is presented. The data from each farm are divided into five themes; *self-development, coach and develop others, support daily kaizen and create vision and align goals*. The last section provides a summary of the interviews and illustrates different aspects for each farm, such as: *indicators to sustain and implement Lean for leaders, working structure, working environment, motivation, communication and skills of a successful leadership*. Descriptions of all farms are found in appendix 3.

5.1 Farm 1

Self-development

Leader 1 states that *“a leader makes decisions even if it is uncomfortable. You have to be specific and able to provide clear instructions. It has to be easy doing the right thing. A leader must be able to communicate with employees and bring in different opinions”*. Leader 1 perceives that a leader who works with Lean must be convinced that the management system saves time in the long-run. The leader must also be stubborn and maintain the work with Lean. Leader 1 describes him/her-self as a listening leader with lack of prestige, but needs to become more structured. However, Lean has made leader 1 more structured.

Employee 1 states that plans and ideas have become more communicated, due to Lean. The respondent perceives that leader 1 provides clear directions. However, leader 1 can improve the communication of plans, the ability to delegate responsibility and structure the daily work. Employee 1 thinks it is more important to give responsibility to others since the workload is continuously increasing.

Lean coach 1 experiences that leader 1 has been enthusiastic and motivated to work with Lean, but lack of time has been a restriction. This has been solved by empowering one of the employees to be responsible for the process of implement Lean.

Coach and develop others

Leader 1 experiences some difficulties in encouraging employees to work with Lean. It is difficult to motivate employees to do Lean as an extra working task, since the company already has high workload. He/she thinks that the ones who understand the benefits with Lean are motivated, but there are also those who do not understand its advantages. The respondent claims that those which do not understand the advantages with Lean are concerned that improved efficiency may lead to layoffs. This mindset may be explained by cultural- and language barriers. Leader 1 thinks that a difficulty with Lean leadership is to allocate enough time to convince and encourage employees of its benefits.

Employee 1 states that *“My motivation is unchanged, since the implementation. It is just as fun as before”*. However, it is of importance to allocate enough time for Lean and become reminded every day. Lean needs to be there all the time, make all employees aware of that they should work according to the principles and think of continuous improvements. Sometimes when he/she has high workload it is less motivating to work with Lean.

Leader 1 and employee 1 agree upon that relationships between employees and leader remains unchanged since the implementation of Lean. It is a flat organisation where there is an open dialogue. Lean coach 1 experiences that leader 1 encourages employees and carry out many of the improvement suggestions. However, it may be difficult for employees to allocate enough time to work with Lean.

Support daily kaizen

Leader 1 works 100 percent with administration and decision-making. The respondent starts every day with a meeting, in order to gather all employees and delegate work tasks. This process has not changed due to Lean, but leader 1 experiences that he/she writes more detailed lists and has actual meetings with employees where they reflect over achieved benefits from Lean.

Leader 1 stresses the importance to bring both small and big problems to surface. The company has a suggestion box where all employees can provide improvement suggestions. This suggestion box is a result of the work with Lean and is frequently used by employees. The respondent believes that it is important that employees feel involved in the improvement process, otherwise the suggestion box is useless. People appreciate when they get feedback on ideas. In the long run it leads to an improved working environment. Leader 1 wants to standardize as much as possible, but as he/she said *“that standardizing a craftsmanship and say that everybody can do every task may lead to unmotivated employees”*.

Leader 1 believes that the work with Lean should be done stepwise. In the long-run all small steps will lead to numerous improvements. The respondent experiences that the output of every working hour has increased due to Lean and it has become more clear to think long-term. The company has become more structured and stricter on creating value for the customers. Leader 1 states that it has been difficult to implement Lean, since it has taken more time than expected. The primary changes due to Lean, is that the company has reduced waste, duplication of work and improved orderliness.

Employee 1 believes that the structure has improved since the implementation of Lean. It is an increased orderliness which has improved the daily work. The respondent perceives that a substantial advantage with Lean is that it sorts out waste. A difficulty is to allocate enough time to work with Lean.

Lean coach 1 states that the company has worked with orderliness, standards and how to work with orders. They are continuously improving through the suggestion box.

Create vision and align goals

Leader 1 states that the goal of Lean was to obtain an improved structure for how things should be done, reduce waste and facilitate work tasks. He/she believes that it will become easier to introduce new employees with written routines. The respondent perceives that they have more structured meetings about goal and strategies, due to Lean. The vision in 10 years is to maintain profitability at same level and low rate of employee turnover.

Employee 1 claims that Lean has created an improved organisation. Lean has facilitated communication of goals and plans. As he/she expressed it: *“It is important to know what to work towards and what the company is aiming for. For the first time goals have been communicated.”*

Lean coach 1 experiences that goals and strategies became clear at a late stage in the implementation process. The goals mainly target production and how to improve quality on products. The company wanted to get structured and improve communication. The respondent believes that the company will sustain with the Lean initiative.

5.2 Farm 2

Self-development

Leader 2 states that “a leader has to be open-minded, collaborative, listen to employees and let employees learn by doing”. Leader 2 thinks that he/she is empowering employees, but needs to become a more authoritarian leader. Leader 2 perceives that he/she must improve the process to create and follow-up goals and strategies. It has been difficult to delegate work tasks, since sometimes he/she believes that it is easier to do it oneself. A leader must be able to delegate and not do everything by him-/herself.

Employee 2 experiences that leader 2 is strong both physically and mentally. The respondent thinks that the leader is always responsive. Employee 2 claims that the leadership has become more clear due to Lean, but leader 2 must improve the ability to delegate work tasks.

Lean coach 2 experiences that leader 2 provides employees the opportunity to speak up. Leader 2 has improved communication, due to Lean. However, leader 2 has difficulties to delegate and empower employees.

Coach and develop others

Leader 2 has experienced difficulties to motivate some employees to work with Lean. Some employees have taken critics from the Lean coach personally and questioned if they really have to be a part of the work with Lean. This mindset may be explained by cultural- and language barriers and that they are not convinced of the benefits with Lean. The ones who understand the benefits of Lean are not difficult to motivate.

For both leader 2 and employee 2, study visits on other farms have been stimulating and motivating. The study visits have been a source of inspiration to work with continuous improvements. However, it has been difficult to obtain written improvements, since the company only consists of six employees and it is easier to express improvement suggestions verbally.

Employee 2 enjoys work and his/her motivation has not changed due to the implementation of Lean. He/she feels more involved in discussing problems in the production process. The relationship among employees and leader has improved slightly. Lean has made everyone little bit more open and talkative.

Lean coach 2 believes that leader 2 fully trust employees, and let them learn by doing and not control in detail. Everyone has become more aware and think through a working task instead of just copying old working routines.

Support daily kaizen

Leader 2 works almost 100 percent in the daily operation. Formulated strategies and defined goals are conducted outside of the ordinary working day. The respondent claims that the company has increased the number of meetings, due to the implementation of Lean. He/she thinks that these meetings will continue after the 18-month Lean project. His/her leadership has contributed towards a more structured working environment at the company, with routines and written reminders. This has improved maintenance procedures on machinery, which reduces urgent problems during peak seasons. In the long run improvements will reduce costs for the company. A substantial contribution due to the introduction of Lean is the morning meetings and the orderliness in the work shop.

A change in the daily work routines for employee 2 is that there is more orderliness and it is easier to find tools, which is an important time saver. The working environment has improved a lot, especially in the work shop. The work flow has improved and a positive aspect is the morning meetings where they can discuss and communicate. Employee 2 claims that “*a difficulty with Lean is that it is harder to go outside the box when many work tasks are standardized. But in the end, the company will save a lot of time*”.

Lean coach 2 experiences that the company has worked extensively with visualization. A white-board is used for notification of machinery maintenance and a list for common items to purchase. Today they communicate and discuss how to perform work tasks and how to improve.

Create vision and align goals

Leader 2 had goals before Lean, but they were not communicated to employees. Today goals are extensively communicated to employees and leader 2 is more open about the economic situation for the company. In the long run leader 2 believes that the goals attributed to higher yields may be reached with support from Lean. To sustain Lean in the long-term at the company, Lean-coaches will be contacted twice a year.

Employee 2 experiences that the goal is more clear and extensively communicated, since they are spoken as well as written down. The goal is to improve yields in production and a vision for the future is to build a new barn.

Lean coach 2 believes that goals are more extensively communicated and clearer to all employees since the implementation of Lean. In the long-run the company wants to increase production and expand the firm. In the short-run the goal has been to improve orderliness and scheduling maintenance procedures.

5.3 Farm 3

Self-development

Leader 3 defines a leader as clear and fair. The respondent thinks that he/she is fair and clear, but needs to become more structured and less afraid of conflicts. A leader education at an early stage of the Lean implementation would have facilitated the process and enabled a deeper understanding for Lean. In order to sustain a Lean initiative it requires continuity and a leader who maintains the work with Lean. Leader 3 does not perceive that he/she has changed as a leader due to the implementation of Lean. In the daily operation there is a self-proclaimed leader who changes routines that have been decided before, this is a problem for the firm.

Employee 3 believes that a leader should be consistent and straight whenever there is a discussion. It is of importance that a leader brings problems to surface and discuss issues immediately. Lean has made it easier to bring problems to its surface and the leadership has become more clear.

Lean coach 3 experiences leader 3 as enthusiastic and has high willingness to work with Lean. Recently the leader has taken a leadership course to develop his/her leadership skills. However, the Lean implementation has been a difficult process for the firm.

Coach and develop others

Leader 3 states that in the beginning of the Lean implementation many employees thought

that Lean was waste of time. Today there is an increased understanding for Lean and its advantages. Many employees have worked for a long time at the company and it has been difficult to change attitudes. Leader 3 has tried to encourage employees to participate in courses and study visits.

The relationships in the company are complex, since formers leaders have been repositioned and have difficulties in accepting decisions from leader 3. However, the communication has improved due to Lean. Employee 3 perceives that they have teamwork with cohesion.

Employee 3 thinks that his/her motivation to work is unchanged. However, he/she enjoys when there is something new going on in the company. He/she has become more aware of how to improve processes. It has not been easy to convince everyone in the production of the benefits of Lean. Today, this has improved but there is still a long way to go. Employee 3 perceives that leader 3 is continuous reminding everyone of Lean and tries to implement a "Lean thinking". However, this has been difficult since some employees are conservative and negative.

Lean coach 3 experiences that it is only three people who want to work with Lean. This is partly due to that some employees had leader 3's position before and have difficulties in accepting his/her leadership. Lean coach 3 tries to encourage the motivated ones and hopes that the rest will follow. It is difficult to be a leader when you continuously get met with opposition. The company needs to focus more on why there is a problem instead of who was causing it.

Support daily kaizen

Leader 3 works almost 100 percent with administrative tasks and the interviewee feels that he/she does not have enough control and insight in the daily operation. Lean has required more administrative work in the introduction phase where routines should be written down and checklists should be created.

Leader 3 experiences that the result of production increase all the time, but cannot definitely state that this is due to Lean. The company has although improved routines for maintenance procedures, which has resulted in less urgent problems. Duplication of work has been reduced since the implementation and communication has enhanced. A goal with the implementation of Lean was to get an opportunity to change old routines. The most important task as a leader has been to make sure that things are actually done and make everyone understand that Lean is not about finding who makes mistakes. Lean should facilitate and it should be easy to do the right thing.

Leader 3 has tried different ways to work with continuous improvements in the firm. They started with a suggestion box, but no one provided any suggestions. Today they try to come up with new suggestions during meetings. In order to support employees, meetings are used in the daily operation. Everyone has to contribute and be involved in the Lean process. However, it is difficult for employees to allocate enough time to work with Lean.

Employee 3 experiences that Lean has saved time. The company has become more efficient and more long-term thinking. It is of importance to think one step ahead and it has actually become a culture in how work is done. Employee 3 believes that the company will continue working according to Lean. A critical point is if the employee turnover increases and Lean thinking may become forgotten. A difficulty with Lean is to think in a new way, since it takes time to integrate the thinking in the daily routines.

Lean coach 3 believes that employees do not work as a team. They have to learn to help each other and just not focus on their own work tasks. A teambuilding activity would be helpful for this company. There has been problems in communication, for example when one employee comes up with a new idea but do not communicate it to the rest. It is a disadvantage when someone has an improvement suggestion but does not share it with others. The company has worked a lot with standards in order to avoid deviations.

Create vision and align goals

Leader 3 states that goals and strategies are formulated together with employees. The goals are for one year period, which could be broken down into sub-goals. The goal in the short run is to avoid duplication of work. In a more long-term perspective the goal is to use resources in a more efficient way. What the company should reach in 5-10 year is more unclear, it is a decision for the owner. The way to formulate goals has not changed since the implementation of Lean.

Employee 3 experiences that the company has always formulated goals and analysed results. The company has been striving to continuously improve, but he/she thinks that the goals have become more clear since the implementation of Lean.

Lean coach 3 thinks that the company has clear strategies and goals, but this is not due to Lean. Long-term goals are more diffuse, but this is due to owner structure.

5.4 Farm 4

Self-development

Leader 4 believes that a leader has an ability to make employees feel that what they do has a meaning. It is also important to share information, so that the employee feels involved. Leader 4's weakness is that he/she needs to improve communication. The respondent perceives that he/she control too much and find it difficult to find a clear division between work and leisure. However, leader 4 does not want to make employees feel controlled. A change in leadership, due to Lean is that he/she communicate information instead of just keeping it in his/her own mind. The most important task for leader 4 during the Lean implementation has been to communicate information, write notifications and visualize critical points in the production. Employee 4 enjoys working at a company where the manager is extensively involved in the production processes.

Lean coach 4 experiences that leader 4 is humble but rather determined. The leader has an open dialogue with employees but still keeps a lot in his/her mind. The employee has many ideas, but it is the leader who controls the production. As a leader he/she is rather structured and has orderliness. However, leader 4 has to reflect more and try to establish meetings.

Coach and develop others

Leader 4 perceives that the most difficult in motivating employees is to make them feel that they make a difference. The respondent tries to vary and shift the work tasks. He/she thinks that the employees have felt motivated to work with Lean. Both leader and employee believe that the standard for the Lean implementation is not always suited for their company. A motivating and inspiring part of Lean has been the study visits, where the company exchanged experience with four other farms. Leader 4 states it is important to involve everyone and that there is not only one person who thinks of improvements.

The relationship between leader 4 and employee 4 has remained unchanged since the implementation of Lean. Lean has made employee 4 a slightly more motivated since it is inspiring when new things are going on and he/she receives various work tasks. The respondent becomes motivated through study visits where he/she can gain experience from other farms. The work flow and the communication of goals have also improved.

Lean coach 4 experiences that employees have an increased awareness in the production, due to the implementation of Lean. Leader 4 tries to involve employees more by education and written routines. Leader 4 trusts his/her employees and takes advantage of ideas.

Support daily kaizen

Leader 4 works 95 percent in the production and the remaining five percent with administrative tasks. A difficulty for the company was that the standard that the Lean coach provided did not really fit with the company. For example when there are only two people working, it feels excess to have whiteboard meetings. Leader 4 thinks that direct communication is more natural, when there are only two people involved. Due to the introduction of Lean there are more written goals and standards that employees may assimilate. The more the company has worked with Lean, the better it has become integrated in the production. An advantage with Lean has been that problems come up to surface and issues are more discussed.

The aim with Lean was to make employees more involved in the production and more aware of critical factors. Leader 4 has tried to inform employees about critical points and how to improve the quality in the production. A result of the work with Lean is that everyone writes down continuous improvements and there is a “to do list”. It is difficult to measure direct results from Lean, but become more efficient release time for other procedures.

Employee 4 experiences that a change due to Lean is that it has facilitated the understanding for problems in the production process. The working structure and orderliness has improved, due to this. The interviewee thinks it is difficult to standardize everything. Employee 4 provided the following example “*a left handed or a right handed will not do a certain tasks exactly the same way and you cannot make one more efficient*”. Lean has improved the orderliness and communication. The most difficult part has been to allocate enough time for Lean.

Lean coach 4 perceives that the major change for farm 4 is that the company uses more whiteboards to provide written disruptions and deviations. By doing this the communication has improved. It has been difficult to come up with improvement suggestion since the company does not have any meetings.

Create vision and align goals

Leader 4’s goal is to eliminate waste in their production process. He/she wants to have as few production disruptions as possible, which may reduce costs. The interviewee wants to avoid instruct employee in detail. The vision is more unclear, since the production is depending on demand. Leader 4 wants to increase and improve the integrated production. The respondent perceives that he/she has more extensively communicated goals and strategies to employees.

Employee 4 states that the goals were stated before Lean, but they have become more clear. The firm wants increased quality on products with fewer deviations. The respondent feels that

he/she can affect to some extent. Lean coach 4 states that the company wants to have a production without any disruptions or deviations and a more integrated production.

5.5 Farm 5

Self-development

Leader 5 believes that a leader should not control activities in detail and must have confidence in employees. The respondent is goal-oriented and has a willingness that processes should work. A weakness for the leader is that he/she needs to improve documentation and follow-up goals. Due to Lean, everyone takes responsibility to think, reflect and provide feedback. Leader 5's most important task during the implementation has been to continuously push and ensure development.

Employee 5 perceives that a leader should have clear goals and provide clear instructions. A leader needs to look forward and involve everyone in order to improve. It is also important that a leader define the direction and deliver results. A difficulty for people that has been working for a long time together is that they usually communicate less. This may create problems since there must be a continuous flow of information.

Lean coach 5 experiences that the governance at the company is hierarchical and traditional. Due to Lean, the company has become more open-minded and there is an attitude that everyone should contribute to develop the firm.

Coach and develop others

Leader 5 experiences that all employees on the farm are motivated to work with Lean. However, some collaboration partners that have been involved in the Lean process are less motivated to work and believe Lean is waste of time. Even though the collaboration partners are not motivated to work with Lean they must work according to standards that the company has formulated. In order to develop and motivate employees, education, study visits, social activities and new technology are provided. Continuous improvements are an ongoing process, which is discussed all time among employees and leaders. Lean has made everyone more involved and interested to influence decisions. A motivation factor for this company is to keep a high quality on products.

Employee 5 believes that Lean has positive impact on motivation, he/she is more aware of procedures and processes. There are no problems to motivate employees in the firm. The company's employee turnover is low and has no problems to recruit. Study visits and agricultural exhibitions are motivating activities. Everyone has become more involved in the company, due to Lean. It is of importance to involve and convince everyone about the benefits with Lean. A change in relationships at the company is the increased understanding for each other and a more open discussion.

Lean coach 5 perceives that employees are encouraged, provided with feedback and that everyone cares about each other. In some situations the company still has traditional governance, but there is an ambition to coach by follow-up and discuss results.

Support daily kaizen

Leader 5 works 50 percent in the daily operation and 50 percent with administration. He/she has carried out the main responsibility of the implementation of Lean. Since the company consists mainly of four people they usually discuss problems verbally. It has been a

substantial advantage to have an external part, a Lean-coach, when bringing problems to its surface and discuss issues. In the daily operation the company has improved the orderliness, standardization for fieldwork, machinery and purchasing. The farm uses a mobile phone application to facilitate purchasing. The company also uses visualization for routine procedures. All these activities have saved time, improved working environment and facilitated the process of introducing new employees and collaboration partners. Lean support employees to feel less insecure, since there are written routines and standards. Due to this, the working environment has improved a lot. The ambition is to maintain the work with Lean. In order to sustain and follow-up with Lean, the company will consult a Lean coach twice a year. The advantages with Lean have been the white-boards, standardization and the study visits. The study visits have been an insightful since there is a possibility to experience performances at other firms. A difficulty is to start and implement Lean principles in the daily operation.

Employer 5 experiences many positive changes due to Lean. An example is the standardized and systematic way of harvesting. An important change in the daily work is that meetings with collaboration partners are more structured and have a clear agenda. A difficulty is to allocate enough time for Lean, especially in the introduction phase.

Lean coach 5 experiences that the company has been working on standards to avoid disorders. There is an open communication whenever there is a problem, which in the long-run may improve quality and avoid the risk of costly mistakes.

Create vision and align goals

The goal with the implementation of Lean was to develop and increase competitiveness. The primary goal was to standardize processes and the quality of the products. Thoroughness is extensively important for this firm. Goals and strategies were formulated even before Lean and this has actually not changed due to the implementation. Everybody in the company is caring for success.

Employee 5 experiences that the owner of the company is extensively clear with goals and strategies and have an open dialogue with all employees. The communication of goals and strategies to all employees has improved due to Lean. Before goals and visions were mostly communicated between leaders and owner.

Lean coach 5 believes that the leader is goal-oriented and has formulated many financial ratios. The respondent states that they have not allocated enough time to communicate goals and visions to employees and collaboration partners.

5.6 Farm 6

Self-development

Leader 6 believes that a leader should provide space for employees to develop. The respondent is not an authoritarian leader and the goal is to be replaceable. Due to Lean, leader 6 thinks that he/she has improved the ability to listen and take advantage of new ideas from employees. Leader 6's most important task with Lean is to make the work go forward. Since everyone has been a part and involved in the Lean process he/she does not experiences it as burdensome.

Employee 6 perceives that a leader can provide clear explanations and empower employees. It is of importance that a leader allocates time to instruct and teach. Leader 6's strength is that

he/she is instructive and there is never a problem to ask questions. However, leader 6 needs to establish an improved balance between work and leisure and not check on details.

Lean coach 6 experiences the leadership as driven and up to date with an ability to make employees follow. A change for this farm, due to Lean, is the increased involvement among employees. Before Lean employees did not have a general picture of the whole company.

Coach and develop others

Leader 6 perceives it is of importance to motivate employees by providing them space. If employees have new ideas they should be encouraged to try them out. It is important to push employees forward and make them develop. There have not been issues regarding motivating the employees to work with Lean. The company attempts to make employees involved to work with continuous improvement by use an "improvement list". Leader 6 tries to be responsive towards opinions from employees. Not take advantage of new ideas and opinions from employees is a sort of waste. Sometimes it can be difficult to allocate enough time to work with continuous improvements. However, *"I think it is better sometimes to let things take some time, so you can think and reflect how you want to have certain things. An example of this is our white-board which became really good, but it also took some time to structure"*.

Employee 6 becomes more motivated when he/she gets positive feedback. The respondent is less motivated when he/she does something wrong and has to redo. All of her/his colleagues are motivated to work with Lean. It is one of the owners that are not too enthusiastic to work with Lean, but usually they convince him/her anyway. There is an open relationship with everybody and a transparent dialogue.

Lean coach 6 thinks that the leader takes advantage of improvement suggestions and are more focused on involving everyone. Improvement suggestions are continuously given and this is due to motivated employees.

Support daily kaizen

Leader 6 works 90 percent in the daily production. He/she believes planning has improved due to Lean. Today they have a clear schedule and routines. The awareness has increased and has developed standards. The company consists of three farms at different sites and therefore everything is fragmented and it is difficult to be efficient. The aim with Lean was to gain an improved structure and become less fragmented. Communication has to work when eight people work together. A difficulty with Lean is to convince everyone of the utility. In this case there were no difficulties motivating employees, it is rather one of the owners who is not favourably oriented towards Lean. A key factor is that the majority wants to work with Lean and is able to understand the advantages. Lean has resulted in more common meetings and it has saved a lot of time. There are a lot of improvement suggestions during those meetings.

Employee 6 experiences that he/she has received various work tasks due to Lean, which makes it easier to change working shift with someone else. Working structure, teamwork and working environment have improved. He/she thinks that one of her colleague that works part time feels much more aware of the procedures in the production. Today communication has improved. During meetings it is easier to bring up issues and employees receive more information. Since the company consists of three farms, it is difficulty to coordinate everyone and meet at the same time, Lean has improved the orderliness, and everyone thinks more in terms of "the right thing at the right place". The whiteboards reduces the possibility of misunderstanding and facilitates.

Lean coach 6 experiences that the farm has had difficulties to allocate enough time for Lean. The daily work takes a lot of time, but the company is driven to work with Lean. The firm has become more structured with fewer deviations. Scheduling and responsibilities are clearer and there is less confusion.

Create vision and align goals

The goal with Lean was to organize and improve the structure in the company. Today, the firm has improved the communication of goals and strategies. The firm will maintain the work with Lean. The 18-month project has only provided the right direction towards what the company is aiming for. Meetings with other farms will continue and the company will consult an external Lean-coach twice a year.

Employee 6 states that the goal with Lean was to arrange meetings where everybody could keep each other informed. The respondent perceives that he/she has little awareness of results for the company, but this is due to his/her own interest.

Lean coach 6 believes that the company has increased communication of goals and strategies to employees. Plans and scheduling are more discussed during meetings.

5.7 Concluding remarks from Lean coaches

The leader plays a central part in order to sustain a Lean initiative. Some leaders require more education in leadership than others. Farms with several employees for a period of time usually have a leader who has matured into the role. A farm which has grown rapidly in a short period of time often has a leader that is more insecure. As farms grow larger the need for leadership skills increases and in general the demand for education in leadership among farmers grows. In order to sustain Lean in the long term a leader must believe in the philosophy and live according to the principles. Three definitions of a leader are quoted below;

“A leader is someone who listens to employees, gives them space and are able to delegate. It is of importance to empower others in order to make employees develop and assume responsibility”.

“A leader believes in their employees, follows-up on results and provides feedback. He/she has an ability to delegate responsibility”.

“A leader has an ability to define goals and vision and the direction for the company. The person should also coach and develop employees and not get too bogged down into details. A leader should be clear with that the work with improvements is the right way.”

The competitiveness of Swedish agriculture may increase with help from Lean. However, it requires that farm managers are able to establish a meeting structure and an awareness of written routines and standards. There need to be continuous improvements even if there is not an external part pushing. The key indicator for succeeding with Lean is communication and continuity. Difficulties with Lean are to allocate enough time and convince every one of its benefits. However, Lean is closely connected to individuals and a small company become vulnerable if the person who is leading the Lean work quits. Therefore, it is of importance to involve all employees to work with Lean. This can be done through continuous inspiration from colleagues or seminars and study visits.

5.8 Concluding remarks from leaders and employees

Leaders and employees believe that Lean is one way to improve the competitiveness for Swedish agriculture. Comparing with Denmark, Danish farms are much more focused and efficient. Swedish farms need to improve governance, since farms are expanding to larger units. Reducing the risk of disruptions and trying to affect the way of working on farms may facilitate to improve competitiveness. Settlement prices are difficult to affect, but a company may affect the quality of their products. If everybody focuses on quality and efficiency the competitiveness can improve and costs may be reduced.

5.9 Assembly of empirical data

The empirical data shows that employees experience that the leadership has in general improved with 32 percent since the introduction of Lean. The employees at the agricultural firms perceive that the leadership has improved one unit on a five units scale since the implementation of Lean. Chart 1 illustrates how employees perceive change in leadership before and after 18 months Lean project.

The agricultural leaders believe that goals- and strategy management has improved in general approximately with 44 percent. The leaders at three farms experience that goals and strategy management has improved two units on a five unit scale. One leader believes that the company has improved one unit. Two leaders think that Lean has not changed goals and strategy management, since the companies had clear goals before implementing Lean. Chart 2 illustrates how leaders perceive goals and strategies management have changed since Lean was implemented.

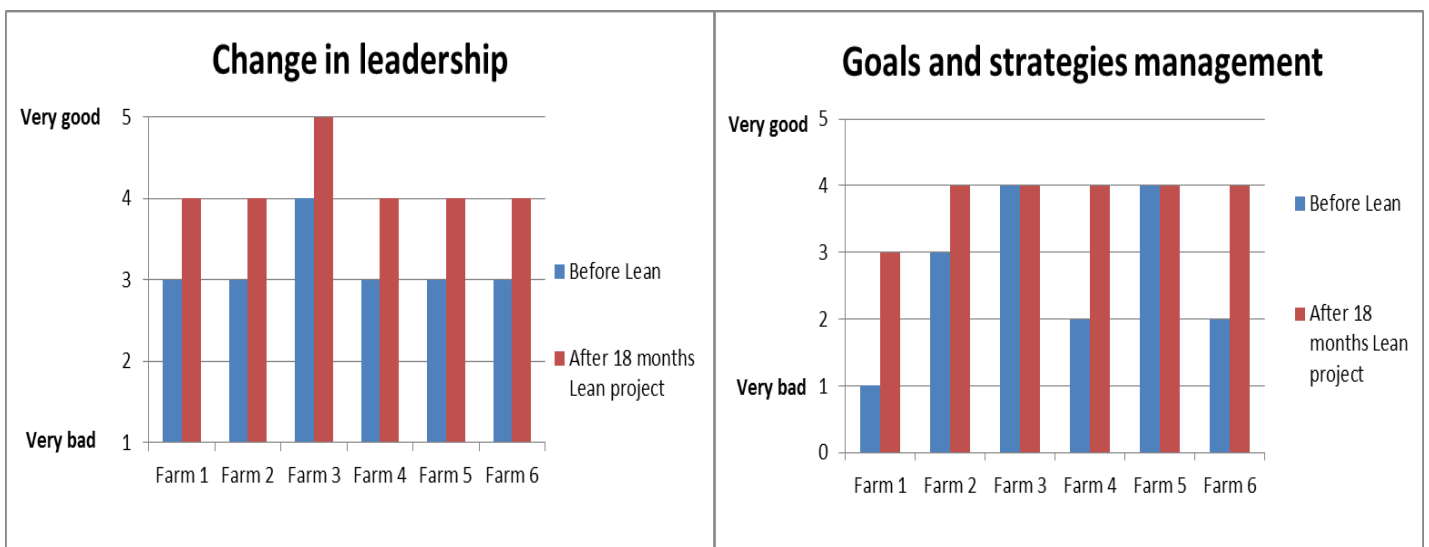


Chart 1. Change in leadership due to Lean (Source own arrangement).

Chart 2. Change in goals and strategy (Source own arrangement.)




-  = Increased
-  = Unchanged
-  = Decreased

Table 4 and 5 provide a summary of the interviews. The tables show indicators for sustaining with a Lean initiative and skills of a successful leadership. They also present changes due to Lean such as working structure, working environment, motivation and communication. The arrows aim to show how factors have different impact when working with Lean.

Table 4. Summary of interviews with farm 1 and 2(Source own arrangement).

	Farm 1		Farm 2		Farm 3		Farm 4		Farm 5		Farm 6	
Indicators to sustain a Lean initiative for leaders	<ul style="list-style-type: none"> • Continuity • Implementation in the whole organisation • Reminder of Lean every day and allocate enough time • Continuously improving by making small steps • Leader, who maintains the work with Lean 		<ul style="list-style-type: none"> • Continuity • Inspirations from other farms by study visits • Maintain meeting structure • External part who follow-up Lean work (Lean coach) 		<ul style="list-style-type: none"> • Continuity • Leader, who maintains the work with Lean • Low employee turnover • Lean integrated into company culture 		<ul style="list-style-type: none"> • Continuity 		<ul style="list-style-type: none"> • Continuity • External part who follow-up Lean work (Lean coach) • A leader who is responsible for pushing to work with Lean 		<ul style="list-style-type: none"> • Continuity • External part who follow-up Lean work (Lean coach) 	
Working structure	<ul style="list-style-type: none"> • Facilitated process to introduce new employees with written routines • Orderliness • Standardization 	<ul style="list-style-type: none"> ↑ ↑ ↑↓ 	<ul style="list-style-type: none"> • Orderliness • Written routines, which reduce urgent problems during peak season. • Meetings • Standardization 	<ul style="list-style-type: none"> ↑ ↑ ↑ ↑↓ 	<ul style="list-style-type: none"> • Written routines, which reduce urgent problems. • Less duplication of work • Meetings • Standardization 	<ul style="list-style-type: none"> ↑ ↑ → ↑ 	<ul style="list-style-type: none"> • Written notification of what has happened in the production • Orderliness • Standardization 	<ul style="list-style-type: none"> ↑ ↑ ↑↓ 	<ul style="list-style-type: none"> • Written routines, which reduce insecurity • Meetings with a clear agenda • Standardization 	<ul style="list-style-type: none"> ↑ ↑ ↑ 	<ul style="list-style-type: none"> • Written notification of what has happened in the production • Orderliness • Standardization • Meetings 	<ul style="list-style-type: none"> ↑ ↑ ↑ ↑
Working environment	<ul style="list-style-type: none"> • Relationships • Working conditions 	<ul style="list-style-type: none"> → ↑ 	<ul style="list-style-type: none"> • Relationships • Working conditions • Work flow 	<ul style="list-style-type: none"> ↑ ↑ ↑ 	<ul style="list-style-type: none"> • Relationships • Work flow 	<ul style="list-style-type: none"> → ↑ 	<ul style="list-style-type: none"> • Relationships • Bring problems to surface 	<ul style="list-style-type: none"> → ↑ 	<ul style="list-style-type: none"> • Relationships 	<ul style="list-style-type: none"> ↑ 	<ul style="list-style-type: none"> • Relationships 	<ul style="list-style-type: none"> →

Table 5. Summary of the interviews (Source own arrangement).

	Farm 1		Farm 2		Farm 3		Farm 4		Farm 5		Farm 6	
Motivation	<ul style="list-style-type: none"> • Convinced of benefits of Lean • High workload • Cultural barriers • Go to work 	<p>↑</p> <p>↓</p> <p>↓</p> <p>→</p>	<ul style="list-style-type: none"> • Convinced of benefits of Lean • Cultural barriers • Study visits • Go to work 	<p>↑</p> <p>↓</p> <p>↑</p> <p>→</p>	<ul style="list-style-type: none"> • Convinced of benefits of Lean • Go to work • Conservative senior workers • High workload 	<p>↑</p> <p>→</p> <p>↓</p> <p>↓</p>	<ul style="list-style-type: none"> • Various work tasks • A leader involved in the production • Study visits 	<p>↑</p> <p>↑</p> <p>↑</p>	<ul style="list-style-type: none"> • Convinced of benefits of Lean • Study visits, education and social activities • Involvement 	<p>↑</p> <p>↑</p> <p>↑</p>	<ul style="list-style-type: none"> • Feedback • Study visits • Involvement (continuous improvements) • A owner who is not favourably oriented towards Lean • Various work tasks 	<p>↑</p> <p>↑</p> <p>↑</p> <p>↓</p> <p>↑</p>
Communication	<ul style="list-style-type: none"> • Employee´s possibility to affect decisions • Goal and vision • Involvement 	<p>↑</p> <p>↑</p> <p>↑</p>	<ul style="list-style-type: none"> • Goal and vision • Open discussion 	<p>↑</p> <p>↑</p>	<ul style="list-style-type: none"> • Goal and vision • Direct communication 	<p>→</p> <p>↑</p>	<ul style="list-style-type: none"> • Goal and vision • Involvement 	<p>↑</p> <p>↑</p>	<ul style="list-style-type: none"> • Goal and vision • Open discussion 	<p>→</p> <p>↑</p>	<ul style="list-style-type: none"> • Goal and vision • Meetings 	<p>↑</p> <p>↑</p>
Skills of a successful leadership	<p>Stubborn, clear, communicative and able to make decisions.</p> <p>Current state: Lack of prestige, clear and responsive. Need to improve structure, delegate responsibility and communication.</p>		<p>Open-minded, collaborative, listener and able to delegate work tasks.</p> <p>Current state: Physical and mentally strong and listen to employees. Need to improve the ability to delegate work tasks.</p>		<p>Fair, clear, consistent and take discussion immediately.</p> <p>Current state: Fair and clear. Need to become more structured and less afraid of conflicts.</p>		<p>Ability to make employees feeling that they make a difference and share information.</p> <p>Current state: Ability to make employees feeling that they make a difference. Need to improve communication and have a more clear division between work and leisure.</p>		<p>Not control employees in detail and have confidence in them. A leader should show the way and be clear.</p> <p>Current state: Goal-oriented and has a willingness that things should work. Need to improve follow-up on goals and documentation.</p>		<p>Give space for employees and make them develop. Be able to ask questions and give clear instructions.</p> <p>Current state: Not an authoritarian leader, who has an ability to provide instructions and create involvement. Need to establish a clear division between work and leisure and not control in detail.</p>	

6 Analysis and discussion

This chapter provides an analysis and discussion of the empirical findings and theoretical framework. This section offers a link between empirical data from the agricultural firms and Lean leadership theory.

6.1 Lean leadership's core values

There are a lot of differences between a global manufacturing industry such as Toyota and Swedish agricultural firms. Lean has been an integrated part of Toyota for decades and the farms participating in *Lean lantbruk* have only worked with Lean for 18 months. However, the situation at the agricultural firms may be explained by using the literature.

According to Toyota, Lean leadership means continuous leader development (Convis & Liker, 2012). The main focus is to strive for improvements in the leadership and hereby, develop the organisation. The ideal stage called True North is when all resource inefficiencies in an organisation are eliminated. True North provides a stable direction to what the company should be aiming for. The empirical data shows that the agricultural firms are striving for continuous improvements. However, there are still many steps before these firms reach True North and resource inefficiencies are eliminated. In general, there is a mindset that continuously doing small steps will in the end lead to perfection. This mindset and self-awareness may to some extent be compared with True North.

The leaders in the agricultural firms are enthusiastic and have a genuine interest in agriculture, with a mindset to keep on improving. But they need to challenge themselves and employees even more. In order to strive for perfection leaders need to define challenges for each individual. By keep on challenge, the company will develop and find new ways to reach the vision. According to Convis & Liker (2012) leaders should assume the challenges to reach a vision with enthusiasm and energy. Challenge is the core value which aims to energize leaders to strive for perfection.

Kaizen thinking or kaizen mind implies to have a mindset where everything is in disarray and nothing is perfect (Shimokawa *et al*, 2009). This mindset is crucial to every leader since by thinking this way there will always be room for improvements (Convis & Liker, 2012). The agricultural leaders want to develop and improve the companies. Nevertheless, it is not out spoken that the leaders are continuously thinking that everything is in disarray. They are more thinking in terms of improving the daily operation.

Genchi genbutsu, or *go and see*, refers to how leaders make decisions (Convis & Liker, 2012). Leaders are expected to possess knowledge of any issue that is in their control by go and see for themselves in the production. Since most of the leaders in agricultural firms are work almost 100 percent in the production they have deep knowledge about issues that arise in the daily work. This is an advantage, since it facilitates for employees to bring forward problems. Leaders may acknowledge problems directly and have a deep understanding for problems that arise.

In agricultural firms many tasks are performed individually. However, the overall performance of the company depends on each individual and by that teamwork is essential. There is a rather close relationship between leaders and employees since all work at the same

place. However, one farm had difficulties in collaborating and work as a team. Some employees at this farm worked only individually and did not help team members when they had the opportunity. This is contradictory to Lean leadership theory which claims that individual success can only be achieved when teamwork is successful (Convis & Liker, 2012). Evidently there is room for improving team work at the agricultural firms. Through teamwork employees and leaders may learn from each other and improve communication, which in the long run may improve the overall performance. For example, one employee performed improvements without letting the team know about it. This is a waste of resources since other in the team will not get the chance to learn from this.

A fundamental core value is to have respect for people (Convis & Liker, 2012). This corresponds well with the agricultural leaders and employees, since most are caring for each other and striving to continuously improve.

6.2 The Toyota Way Leadership Development Model

This section provides an analysis of each step in the Toyota leadership development model. The leadership development model consist of four steps; *self-development, coach and develop others, support daily kaizen* and *create align goals and vision*.

6.2.1 Self-development

The empirical findings show that there are several skills of a leader in the agricultural firms that are central in Lean leadership theory, such as give clear instructions, have an open-mind and listen to what employees really say. Four out of six firms have stated that a leader is clear, meaning that a leader should be specific and have an ability to instruct. Another skill that three out of six firms point out as is important is the ability of a leader to delegate and not control employees in detail. Other skills that respondents have mentioned are lack of prestige, ability to define the direction, collaborative, involved in the production and allocate enough time to teach and instruct. Most of the leaders in the agricultural firms are not authoritarian leaders. They do not need to be authoritarian in order to influence and motivate employees toward common objectives. This corresponds well with central skills in Toyota leadership by Convis & Liker (2012).

According to Balmer-Hansen *et al* (2013) the ability to point out the direction and create meaning is crucial as a leader when working with Lean. Their study reveals that in order to succeed with Lean, a leader must be involved in the production and have an understanding of the value streams in the daily work. The agricultural managers have improved their ability to define the direction, but they can still make numerous of improvements. As mentioned above, a major advantage for these leaders is that they have a substantial knowledge and understanding for the daily production. It is easier for these leaders to actively acknowledge improvements, make changes and find out what needs to be done (Shimokawa *et al*, 2009). Four out of six leaders are listening and responsive to employees. As one respondent stated:

“I believe that a leader has an ability to make people feel that what they do has a meaning”.

To conclude important skills which indicate a potential success of Lean leadership for agricultural firms a summary is given below:

- **Clear-** a leader who is specific and has an ability to instruct.
- **Open-minded-** collaborative, responsive and listen to what employees really say.
- **Ability to delegate-** a leader who do not control in detail and can empower others

- **Define the direction-** a leader who has an ability to communicate goals and vision.

Leaders at four out of six farms find it difficult to separate work from leisure and delegate work tasks and responsibility. These four leaders are owners of the companies, whereas the other two leaders are employed. This may be explained by that it is more difficult for a leader that is also an owner of the firm to separate work from leisure compared to a leader who is employed. As mentioned above agricultural leaders have deep knowledge of the daily production and sometimes there seem to be a mindset that “it is easier to do it yourself rather than empower others”. However, Lean has made the agricultural leaders more aware of the benefits of empowering others and they try to relax the control. As the farms grow larger, it is crucial for the leaders to have the ability to delegate and not become too detailed. A leader must trust its employees and believe that they can find the best solution themselves. The empirical data shows that three out of six leaders must be more structured. Respondents have also mentioned a need for improvements in creating goals, strategies and communication.

According to the literature a leader should let employees develop independence and assume responsibility (Concis & Liker, 2012). The results from the interviews show that the leaders try to let employees develop independence and give responsibility. However, as mentioned some leaders have difficulties in separate work from leisure and not check on details.

All leaders in the agricultural firms have expertise in the production and ability to perform every task. A fundamental idea in Toyota leadership is that a leader cannot teach others what the leader cannot do him/her-self and a foundation for all learnings at Toyota is “learning by doing” (Convis & Liker, 2012). This implies that the agricultural firms are operating in accordance with the fundamental idea in Toyota, that a leader cannot teach others what the leader cannot do him/her-self. Most of the agricultural firms also use the principle “learning by doing”, when learning new routines and work tasks. Leaders in the agricultural firms try to let employees find a solution on a problem and let them try new things. This corresponds well with Toyota’s conscious process of looking back and to learn from past experience (Convis & Liker, 2012).

The employees at agricultural firms perceive that the leadership has improved one unit on a 1-5 scale since the implementation of Lean (shown in chart 1).The leadership has improved on average approximately with 32 percentages. This is mostly due to improved communication, clarity and that employees feel an increased involvement. Lean coaches and leaders argue that there is an increased demand for leadership education and development. This demand increases as farms grow larger.

6.2.2 Coach and develop others

Liker (2004) uses the two dimension leadership model to show skills of Toyota’s leadership. This model includes four types of leadership; *group facilitator*, *builder of a learning organisation*, *bureaucratic manager* and *task manager*. Figure 7 illustrated the leadership model and skills for agricultural leaders. The leadership at Toyota is characterized by a learning organisation. This is contradictory to agricultural leaders who are task managers, characterized by a leadership with deep understanding of work and a top-down management. However, agricultural leaders may be found in all four types of leadership depending on the situation to various extents.

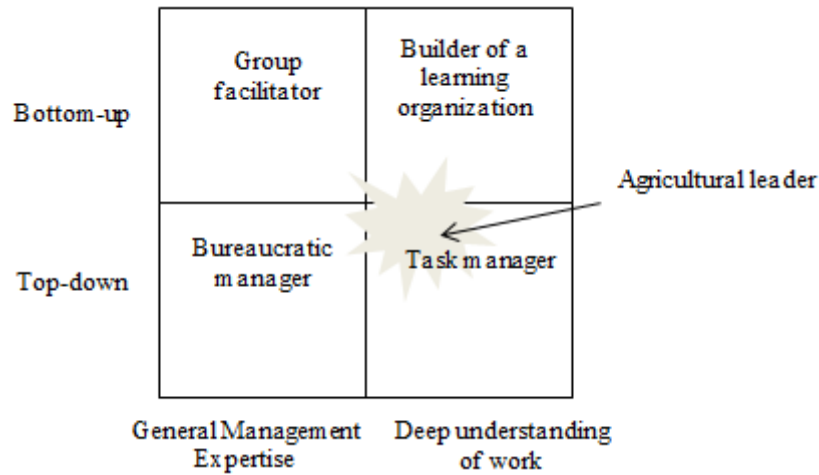


Figure 7. The two leadership matrix showing leadership on agricultural firms (own modification of Liker, 2004).

All of the farms have a rather flat organisational structure, but one of the farms is more hierarchical than the others. Toyota states that it is costly to have a flat organisational structure, since it often implies many employees per leader (Convis & Liker, 2012). Toyota has as a goal to have one leader for every five employees. In agricultural firms a flat organisational structure is not costly, since the number of employees is quite low. The leaders often develop a close attention to the everyday production and therefore it is more likely to find the cause of the problem, eliminate waste and coach employees (Convis & Liker, 2012).

The empirical data show that there are several factors that affect the motivation to work with Lean. These factors are presented in table 6 and more thoroughly analysed and described below.

Table 6. Factors that are affecting motivation to work with Lean.

<i>Increasing</i> ↑	<i>Unchanged</i> →	<i>Decreasing</i> ↓
<ul style="list-style-type: none"> • Convinced of benefits of Lean • Study visits, education and social activities • Various work tasks • A leader involved in the production • Meetings • Feedback • Involvement (continuous improvements) 	<ul style="list-style-type: none"> • Go to work 	<ul style="list-style-type: none"> • High work load • Cultural barriers • Conservative senior workers • A owner who is not favourable oriented towards Lean

A motivating factor that four out of six firms mention is that if employees and leader are convinced about the benefits of Lean, they are also motivated to work with Lean. Cultural- and language barriers and conservative senior workers are two factors which affect motivation negatively. Cultural differences, where employees have a different mindset and do not understand the aim with Lean, may cause less motivation among these employees to work with Lean. Leaders experience that these employees believe that a more efficient company leads to layoffs and that these employees have taken critics from Lean coach personally. Language barriers may cause difficulties for leaders to convince these employees of the

benefits with Lean. Some conservative senior workers show less willingness to adapt new ways to work and it can be difficult for leaders to encourage and change their pattern. This corresponds well to the literature, where senior workers find it difficult to adapt Lean principles and perceive it has a negative effect on job satisfaction (Vidal, 2007). The empirical data also show an increased risk for different opinions, when the owning structure involves several people and one owner are not favourably oriented towards Lean, which may decrease motivation. The individual willingness to adapt Lean principles both from managers and employees determine to a substantial extent the outcome (Vidal, 2007).

It may be difficult for leaders to encourage employees to work with Lean, when the company already has high workload, especially during peak season. Some companies have a mindset that Lean is an additional work task and during peak season the work with Lean may be a burden. Agricultural peak season is a stressful time, since it is crucial for example to harvest crops at the right time, otherwise there may be substantial economic losses. These firms have worked with Lean for 18 months and are still in the introductory phase. It is impossible to require that Lean thinking has become so integrated into the companies, that it is viewed as a natural part even in peak season. In the future, Lean may be a part of the whole organisation and be viewed as a natural part in the daily operation and not as an extra work task. Peak season or not, waste must always be eliminated. However, it will take time before the agricultural companies change their mindset totally.

Four out of six farms state that study visits are inspiring and increase motivation. By looking at other farms the companies may gain experiences from Lean operations and continuous improvements. Two employees mention that they become motivated when new things occurs at the farm such as; Lean meetings, education and social activities. Three employees state that their motivations to go to work remain unchanged since the implementation, they are genuinely interested in their work whether the company uses Lean or not. However, two employees experience various work tasks due to Lean, which increase motivation. This is in accordance with the literature, which states that various work tasks is a motivating factor (Liker, 2004).

While research (Convis & Liker, 2012) emphasizes the importance of a leader to provide feedback, the result of this study indicates that agricultural leaders may improve this process. It is of importance to identify strengths and weaknesses of each individual. One of the employees states that he/she is more motivated when feedback is provided. However, most agricultural leaders do not provide performance appraisals. This may be a way to develop employees and increase involvement. The empirical data show that involvement through continuous improvements is positive for motivation. This motivates agricultural leaders to implement performance appraisals, in order to provide feedback and increase involvement among employees. Empirical data show that structured meetings enhance motivation among employees. Another factor that increases motivation is a leader who is involved and has knowledge of the production.

A precondition for developing an organisation is employees that are motivated and involved in improving the company. The employees that were interviewed are involved to work with Lean, but as mentioned above there are also some unmotivated. There are several advantages for the agricultural firms to provide incentives for the employees to work with continuous improvements. Incentives that have a clear linkage to goals are motivating. For example, when goals are achieved employees that have contributed should be rewarded. Daily meetings are also motivating and improve the communication between leaders and employees as well

as between employees. Direct communication reduces the risk of misunderstandings and asymmetric information.

6.2.3 Support daily Kaizen

The leaders' role is to continuously add energy to the improvement process and the goal is to strive for perfection (Convis & Liker, 2012). It is a long-term challenge to work with kaizen. Lean can not be achieved without kaizen but kaizen is dependent on team members and their performance. After 18-month all farms has found ways to continuously improve, by working with Lean. One farm uses a "suggestion box", where employees can anonymously provide suggestions. Another uses a white board, where suggestions can be written down and a third provides suggestions verbally. It has been important for all companies to have meetings, since it is an opportunity to gather everyone and come up with new suggestions. There may also be an advantage to have one employee responsible for improvement suggestions.

There are numerous examples of improvements in working structure and working environment. All farms experience positive outcomes from written routines, which have reduced urgent problems during peak season, reduced insecurity and facilitation of the process of introducing new employees. Due to Lean three farms have improved the meeting structure and all these farms create an increased involvement through these meetings. One farm has a more clear agenda on meetings. Another farm did not have any meetings before, but this has changed due to Lean. Establishing a meeting structure is essential in order to sustain a Lean initiative. Established structural meetings create involvement, facilitate discussion, reflection and a platform for feedback, which may lead to improvements. This is one way to support daily kaizen. One farm has not succeeded in establishing a meeting structure, this is due that it is only two people who work in the production and they talk verbally. Even if the company is positive to work with Lean it may be difficult to develop improvements without any structural meetings in the long run.

All farms work one way or another with standardization. Everyone is positive to standardize work tasks to some extent since they realize that time can be saved and facilitate procedures. However, three respondents are critic to standardize every work task, which is quoted below. Similar critics are also found in other studies (Howison, 2009; Berglund, 2010).

"Standardizing a craftsmanship and say that everybody can do every task may lead to unmotivated employees".

"A difficulty with Lean is that it is harder to go outside the box when many work tasks are standardized. But in the end, the company will save a lot of time".

"A left handed or a right handed will not do a certain tasks exactly the same way and you cannot make one more efficient".

A major difference between standardization in an industry compared to an agricultural firm is that agriculture has a biological process to take into account. The biological process has longer lead times, depends on weather and is more exposed to unexpected events. It is therefore more difficult to standardize every process and eliminate waste. However, there is an advantage to standardize work tasks that are possible since it may save time and avoid mistakes. Formulation of standards should be conducted in collaboration and agreement with employees, which create a platform for improvements.

Four farms have improved orderliness, due to Lean and one farm mention that duplication of work has decreased. Two farms experience improvements in workflow. Today there is an enhanced structure and control when purchasing inputs, by using lists for joint purchasing. One of the farms also has a mobile phone application to facilitate purchasing. This facilitates for the leaders to coordinate and control the daily operation. The relationships at the farms remain unchanged or have improved due to Lean. The discussion is more open and problems come to surface easier.

6.2.4 Create align goals and vision

Goals and visions in agricultural companies are more clear, due to Lean. This is important to every business (Convis & Liker, 2012). At Toyota this is critical since the leadership is centralized to “True North”. Toyota uses *hoshin kanri* to coordinate directed actions in the organisation. It is the process of defining goals, but also a concrete plan of how to reach those goals. Toyota has a vision for a ten year time horizon, which is broken down into five-year business plan and annual plans. Comparing vision and goals at Toyota with the agricultural firms show that there are differences. Most of the agricultural companies have a long term vision, but it is not expressed and communicated. However, the employees perceive that this has improved due to Lean. The leaders at three farms experience that goals and strategy management has improved with two units on a 1-5 scale (shown in chart 2). One leader believes that the company has improved one unit. Two leaders perceive that Lean has not changed goals and strategy management, since the companies had clear goals before implementing Lean. The leaders which do not experience any changes in goals and strategy management are employed leaders, whereas the other leaders are also owners of their companies. This raises an interesting point where employed leader already may have high requirements from owners on goals and strategy management. Leaders who are owners may want to believe that they have improved a lot, due to Lean. The goal and strategy management has improved on average with 44 percentages at the agricultural firms. The empirical data show that Lean makes leaders more aware of the importance of communicating goals and strategies. By communicating goals and strategies employees become more involved and aware of directions for the company. As one of the employees expressed it:

“It is important to know what to work towards and what the company is aiming for. For the first time goals have become communicated.”

The goals at the agricultural firms are in general annual plans which mostly are target yield and quality of production. The overall communication has improved at all farms. A difficulty for people that has been working for a long time together is that they usually communicate less. This may create problems since there must be a continuous flow of information. Employees feel that they can affect decisions to a greater extent, that it is a more direct communication, open discussion and meetings which have created more involvement. However, there are still lots of room for improvements in goal and strategy management. It is important to improve the process of follow-up goals and find ways to measure these goals. For example one leader wants to have as few production disruptions as possible, but has not established a way to measure this goal. Without measurements, the effect of work towards improvement will not be visualized and this may lead to a decrease in motivation. By establishing reports on deviations a measurement is created and in the long-term the company may observe the result of improvements. This corresponds well with the literature that states that a leader should act out of measurements (Balmer- Hansen *et al*, 2013; Convis & Liker, 2012). Otherwise decisions can be made too late and it will be more difficult to reach the

strategic goals. It is also important that the leaders are transparent and do not have any problems to communicate their economic situation.

6.3 Indicators to sustain with a Lean initiative

Bodek (2008) argues that without leaders no company can sustain a Lean initiative. This corresponds well with empirical data from this study which shows that leaders play a central role in sustaining a long term Lean initiative. In order to sustain Lean a leader must believe in the philosophy and live according to the principles the long term. It is evident that the leaders keep pushing and maintain the work with Lean. A way to continuously develop is to work with Lean in small steps. To work with Lean stepwise facilitates the process to convince and motivate employees. In the long run all small steps will lead to numerous improvements and it may be a motivating factor to visualize the results of Lean. Balmer- Hansen *et al* (2013) stress the importance of visualizing achieved results as a motivating factor to work with continuous improvements.

According to a study conducted by Balmer-Hansen *et al* (2013) it is necessary for leaders to allocate enough time for continuous improvements, find ways to measure and visualize the effect of the work of improvements. A common pitfall is to always prioritize the daily operation before the work of improvements. The daily operations in agriculture require a lot of time and it is important that employees and leaders are present daily. The agricultural firms struggle to allocate enough time for Lean. All farms agree that continuity is an important indicator to sustain Lean in the long term. It is vital to have a reminder of Lean every day and allocate enough time for Lean.

Three farms state that an external part who follow-up Lean work are important to maintain the work with Lean. However, it is essential that the farms work with continuous improvements even if there is not an external part pushing. An established meeting structure is also important. Meetings offer opportunities for communication and open discussions on goals, issues and improvements. Two farms mention that an indicator to sustain Lean in long term is to have Lean integrated into the whole organisation and into the company culture. In accordance with the literature a sustainable Lean initiative includes everyone in an organisation (Mann, 2009). A low employee turn-over may facilitate to work with Lean. A small company becomes vulnerable if the person who is leading the Lean work quits. Therefore, it is of importance to involve as many as possible to work with Lean. This is in accordance to Lewis's study from 2000, where a small organisation became vulnerable when working with Lean. When other companies headhunted employees, the small organisation had to struggle to replace keyworkers.

The human dimensions of respect for people, empowerment and involvement are vital for a long-term sustainability with Lean, regardless of industry (Hines *et al*, 2004). The empirical data show that involvement may be created by study visits, education and seminars. These inspirational events may facilitate to sustain a Lean initiative in long term.

The results of this study confirm earlier research that there are two dimensions to take into account when explaining requirements for the leadership to implement and sustain a Lean initiative in agricultural firms: *leaders* and *employees*. The dimensions are just as important, and without one other Lean will not sustain. Figure 8 illustrates important factors in each dimension.

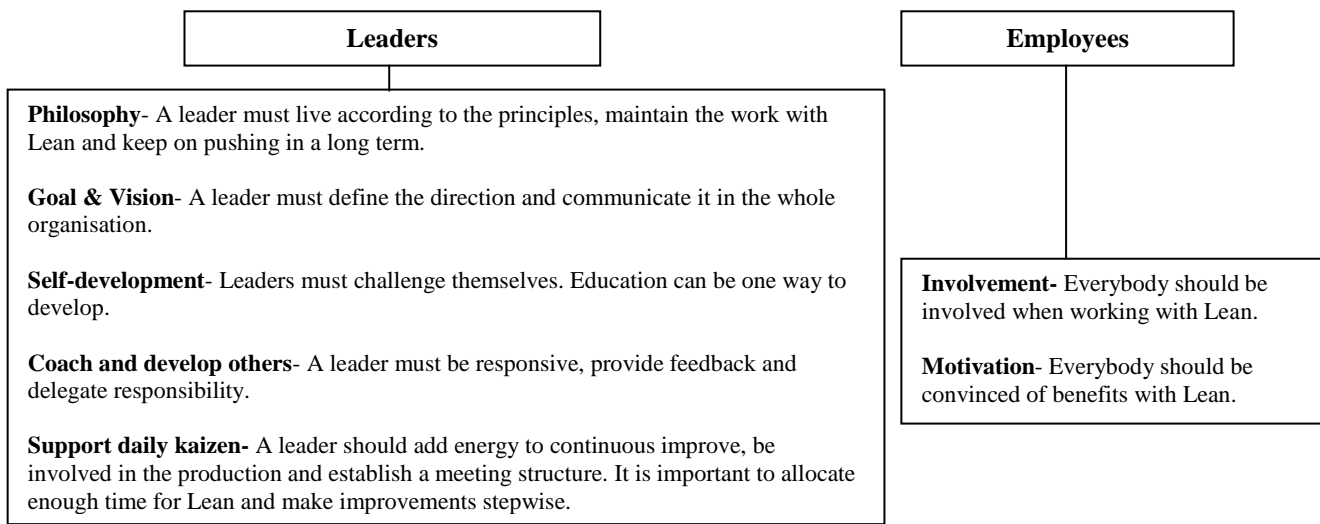


Figure 8. Important factors to sustain with a Lean initiative (own arrangement).

The empirical results show that everyone agrees that Lean may be one way for agricultural firms to become more competitive. A more competitive Swedish agricultural sector will improve the long-term profitability and the conditions for future farmers. A sustainable agriculture may have a positive impact on the Swedish welfare. The Swedish agriculture creates job opportunities, an open landscape and local developments. The project Lean Lantbruk is an opportunity for the Swedish agriculture to become more competitive. It will require enthusiastic agricultural leaders who believe in the philosophy. To implement sustainable Lean initiatives in Swedish agriculture require external support from agricultural consultants, benchmarking and a common direction for the whole agricultural sector.

6.4 Generalizability and quality of data

This study uses a flexible design and there is almost no numerical data collected. Hence, a statistical generalization is not feasible. The only numerical data collected is the graded value of the change in leadership and goals and strategy management. It may be acknowledged that the numerical values are subjectively graded by employees and leaders. These values may therefore present a more positive result than the actual reality.

The generalizability of this study could have been higher if more than six case studies were included. However, the reliability would decrease since the data collection for each farm would not have been as thorough, if more farms were involved. It may also be acknowledged that the leaders at the agricultural farms have chosen which employees should be interviewed. This may affect the results and provide a more positive perspective. The quality of the data would increase if all employees at the farms were interviewed. In addition, the farms that participate in Lean lantbruk have paid a fee to be a part in the project. Therefore, they may have an interest to receive a more positive result on invested money and display a more optimistic attitude towards Lean from the beginning.

There is also a risk that the researchers may have developed a positive view towards Lean as a concept and the answers from the interviewees. The empirics may be debated, since the researchers have made an own interpretation from the large amount of data. In total there are 100 farms that participate in Lean Lantbruk in Halland and Västergötland. The results may not be generalizable for all these farms, since another geographical region may result in another outcome. However, the farms that were examined have a similar structure as the rest of the geographical region, where most of the farms have more than 100 ha of arable land (www, Swedish Board of Agriculture, 4, 2014). This is an explanatory study where a specific situation is examined and analysed on the basis of Lean leadership theory. Conclusions can be drawn from the six case studies in order to answer the aim of this study.

7 Conclusions

The aim of this study is to explain how agricultural firms can use Lean as a way to work with leadership, by evaluating indicators which have potential to make Lean leadership successful.

7.1 Leadership skills for a successful Lean leadership

Important skills for leaders which indicate potential success of Lean leadership for agricultural firms are clear, open-minded, ability to delegate and define the direction. A leader must be clear, which means that he/she has an ability to instruct and be specific. Open-minded refers to that a leader is collaborative, responsive and listens to what employees really say. The ability to delegate for a leader is crucial. It is of importance to empower employees and not control in detail. An essential skill for a leader is the ability to define the direction, since it is vital to have the ability to communicate goals and vision to everyone in the firm.

7.2 Changes due to Lean leadership

There are changes in the agricultural firms in terms of working structure, working environment, motivation and communication, due to Lean leadership. The process of introducing new employees with written routines and orderliness has improved. Written routines also reduce the risk of urgent problems during peak season. Meetings and reduced duplication of work have a positive impact on working structure. Since the implementation of Lean many work tasks have become standardized. Standardization reduces the risk of deviations, but may have negative impact on motivation among employees. Relationships in the agricultural firms remain unchanged or have improved a little, due to a more open discussion. The working environment has improved in terms of work flow, working conditions and it has become easier to bring problems to surface.

Lean leadership has not increased the motivation to go to work. However, it has created an increased involvement in the firms. Due to Lean, employees have become empowered to various work tasks and study visits have become more frequent. Employees that are convinced of the benefits of Lean are more motivated to work with Lean. Cultural- and language barriers and conservative senior workers which do not understand the benefits with Lean are less motivated. Other motivating factors to work with Lean are feedback, meetings and a leader who is involved in the production. High workload during peak season cause less motivation to work with Lean.

Communication in an organisation is a key factor and has improved substantial in the agricultural firms. It has become a more open discussion and created more involvement through meetings. Today goal and vision are more communicated to everyone in the organisation. It facilitates for everyone to understand what to work towards. The empirical data show that Lean makes leaders more aware of the importance of communicating goals and strategies. The goal and strategy management has improved on average with 44 percentages at the agricultural firms. Communication of goals and strategies to employees increase involvement and awareness of directions for the firms. The leadership has improved on average approximately with 32 percentages. This is mostly due to an increased communication, clearness and that employees feel more involved.

7.3 Indicators to sustain Lean long-term

There are several indicators in leadership, which are required in order to implement and sustain Lean in Swedish agricultural firms. The most evident indicator is continuity, implying that the leadership maintains the work with Lean and that there is a constant reminder of Lean in the daily work. The leader must implement Lean in the whole organisation and make the management system integrated into the company culture. As a leader it is important to make continuous improvements stepwise, since involvement and motivation among employees increases. Establishing a meeting structure is also vital, since it provides a platform for communication and way to work with continuous improvements. Inspirational factors such as study visits, social activities and education may inject energy for both employees and leaders to maintain the work with Lean. A way to facilitate for the leaders to sustain with the Lean initiative is to consult an external part, who follow-up, inspire and push the company forward. The agricultural firms are characterized by a small number of employees. They are therefore dependent on their employees. A low employee turn-over will stabilize the Lean culture.

7.4 Further research

There are numerous areas within the agricultural firms and Lean that could be interesting to further examine. A larger amount of empirical data would enable to make statistical generalization. Furthermore, it would be interesting to evaluate the economic outcome of the Lean implementation in the agricultural firms. Hereby, a positive result would prove that Lean is a way of increasing the competitiveness in Swedish agriculture.

Lean in the agricultural firms is still in the introductory phase, it would be ideal to examine the agricultural firms in 3-4 years. In 3-4 years it will be more clear to identify occurring changes. Another perspective would be to examine what skills are required of employees to sustain and successfully work with Lean.

Bibliography

Literature and publications

Abrahamsson, L., Johansson, J. Johansson, S. 2013. *If you can't beat them, join them? The Swedish trade union movement and Lean*. Luleå: Sage publications Ltd.

Achanga, P., Shehab, E., Roy, R., Nelder, G. 2005. *Critical success factors for Lean implementation within SMEs*. Cranfield: Department of Enterprise Integration, Cranfield University.

Appelbaum, E., Bailey, T., Berg, P., Kalleberg, A. 2000. *Manufacturing Advantage: Why High Performance Work Systems Pay Off*. Ithaca: Cornell University Press.

Balmer-Hansen, C., Stochholm-Normand, J., Simonsen, M. 2013. *The skilled Lean leader*. Horsholm: Borsens Forlag.

Bass, B., Bass, R. 2008. *The Bass Handbook of Leadership: Theory, Research and Managerial Application*. New York: Free press.

Bennis, W. 1984. *Where have all the leaders gone? In W.E. Rosenbasck & R.L. Taylor, Contemporary issues in leadership*. Boulder: Westview, pp. 42-60.

Berglund, M., Melin, M., Rydberg, A., Sundström, B., Österberg, K. 2011. *Konkurrenskraftigare grisföretagare med Lean- Metodik för hur Lean kan introduceras på slaktgrisgårdar*. Uppsala: Institutet för jordbruks- och miljö teknik. JTI rapport lantbruk och industri 399.

Berglund, R. 2010. *Commitment wanted – How three manufacturing companies seek their workers' contribution when implementing Lean*. Gothenburg: Swerea IVF.

Bodek, N. 2008. *Leadership is Critical to Lean*. Vancouver: Manufacturing Engineering.

Bravo-Ureta, B.E., Rieger, L. 1991. *Dairy farm efficiency measurement using stochastic frontiers and neoclassical duality*. Oxford: American Journal of Agricultural Economics 73.

Bromley, D. 1986. *The Case study Method in Psychology and Related Disciplines*. Chichester: Wiley.

Brolin, G. 2003. *Att utveckla effektivare och socialt mer ansvarstagande*. Stockholm: Arbetslivsinstitutet.

Burns, J.M. 1978. *Leadership*. New York: Harper and Row.

Collins, J. 2011. *Good to great*. Stockholm: Bookhouse Editions AB.

Convis, G., Liker, J. 2012. *The Toyota Way to Lean Leadership*. New York: McGraw Hill.

Cook, C.W., Hunsaker, P.L. 2001. *Management and Organisational Behavior, third ed*. New York: McGraw-Hill.

- Doolen, T., Hacker, M. 2005. *A Review of Lean Assessment in Organisations: An Exploratory Study of Lean Practices by Electronics Manufacturers*. Oregon: Journal of Manufacturing Systems Volume 24/No. 1.
- Dubrin, A. 2010. *Principles of leadership, sixth edition*. Rochester: South western cengage learning.
- Durward, K., Sobek II, Smalley, A. 2008. *Understanding A3 thinking- A Critical Component of Toyota's PDCA Management System*. New York: CRC Press.
- Dyrendahl, C., Granath, J. 2011. Lean för lantbruksföretag- utvärdering av industriellt managementsystem i agrar kontext. Uppsala: Sveriges lantbruksuniversitet.
- Ekman, S., Gullstrand, J. 2006. *Agriculture and Competitiveness*. Lund: Livsmedelsökonomiska institutet.
- Eisenhardt, K, M. 1989. *Building Theories from Case Study Research*. Stanford: Academy of management review, Vol. 14, No. 4, pp.532-550.
- Hansson, H. 2007. *Strategy factors as drivers and restraints on dairy farm performance; Evidence from Sweden*. Uppsala: Swedish University of Agricultural Sciences.
- Hansson, H., Öhlmer, B. 2008. *The effect of operational managerial practices on economic, technical and allocative efficiency at Swedish dairy farms*. Uppsala: Swedish University of Agricultural Sciences.
- Hakelius, K. 1999. *Farmer Cooperatives in the 21st Century: Young and Old Farmers in Sweden*. Uppsala: Swedish University of Agricultural Sciences.
- Hersey, P. Blanchard, K. H. 1993. *Management of organisational behavior, utilizing human resources, 6th edition*. Englewood-Cliffs: Prentice-Hall.
- Herzberg, F. 1959. *The Motivation to Work*. New York: John Wiley and Sons.
- Heshmati, A., Kumbhakar, S.C. 1994. *Farm heterogeneity and technical efficiency: some results from Swedish dairy farms*. Gothenburg: The Journal of Productivity Analysis 5, 45–61.
- Hines, P., Holweg, M., Rich, N. 2004. *Learning to Evolve- A Review of Contemporary Lean Thinking*. Cardiff: International Journal of Operations and Management. Vol. 24 No. 10, p 994-1011.
- Houlahan, C.J. 1994. *Reduction of front-end loading of inventory- making the airframe industry Lean through better inventory management*. Cambridge: Massachusetts Institute of Technology.
- Howison, J. 2009. A Tough “Cell”: *Implementing Lean at Toledo Jeep*. New York: Critical sociology.
- Hunter, S.L. 2008. *The Toyota production system applied to the upholstery furniture manufacturing industry*. Mississippi: Materials and Manufacturing Processes 23(7): 629-634.

- Hyde, K. 2000. *Recognizing deductive processes in qualitative research*. Auckland: Qualitative Market Research: An International Journal. Vol. 3 No. 2, pp. 82-89.
- Kemp, D.R., Girdwood, J., Parton, K.A., Charry, A.A. 2004. *Farm management- rethinking directions*. Sydney: AFBM Journal, pp. 36-44.
- Kouzim, A., Korac-Kakabadse, N. 2000. *Mapping Institutional Impacts of Lean Communication in Lean Agencies: Information Technology Illiteracy and Leadership Failure*. Sydney: Sage publications Ltd.
- Kvale, S. 1997. *Den kvalitativa forskningsintervjun*. Lund: Studentlitteratur.
- Laughlin, K. 1995. *Increasing competitiveness with a cellular process*. Georgia: Industrial Engg, Norcross.
- Lawson, G.E., Agger, J.F., Lund, M., Coelli, T. 2004. *Lameness, metabolic and digestive disorders, and technical efficiency in Danish dairy herds: a stochastic frontier production function approach*. Fredriksberg, Australia: Livestock Production Science 91.
- Lewis, M. A. 2000. *Lean and Sustainable Competitive Advantage*. Coventry: International Journal of Operations & Production Management. Vol. 20 No. 8, p. 959-978.
- Liker, J. K. 2004. *The Toyota Way - 14 Management Principles from the World's greatest Manufacturer*, McGraw-Hill: New York.
- Lund, M., & Noell, C. 2002. *The Balanced Scorecard for Danish Farms – Vague Framework or Functional Instrument?* NJF Seminar No. 345.
- Macduffie, J.P., Sethuraman, K., Fisher, M.L. 1996. *Product variety and manufacturing performance- evidence from the international automotive assembly plant study*. Pennsylvania: Mgmt Science (V42).
- Mann, D. 2009. *The Missing Link: Lean Leadership*. Michigan: Frontiers of Health Services Management.
- Mintzberg, H., Waters, J.A. 1982. *Tracking strategy in an entrepreneurial form*. Quebec: Academy of Management Journal 25.
- Northouse, P. G. 2007. *Leadership: Theory and practice*. Sage: Thousand Oaks.
- Oliver, P. 2010. *The Student Guide to Research Ethics*. Maidenhead: McGraw Hill.
- Olsson, M., Hellsmark, H. 2012. *Effektutvärdering av produktionslyftet. Fas 1:2007-2010*. Borås: Vinnova Rapport VR 2012:14. Sp Sveriges Tekniska Forskningsinstitut. Vinnova.
- Oude Lansink, A., Pietola, K., Bäckman, S., 2002. *Efficiency and productivity of conventional and organic farms in Finland 1994–1997*. Oxford: European Review of Agricultural Economics 29, 51–65.
- Regeringskansliet, 2013. *Konkurrenskraft och utvecklingsmöjligheter för svenskt jordbruk- och trädgårdsproduktion, Kommittédirektiv, Dir 2013:20*. Stockholm: Regeringskansliet.

- Robbins, S. P & Coulter, M. 2009. *Management 10:th edition*. New Jersey: Pearson Education..
- Robson, C. 2002. *Real World Research (2nd ed.)*. Cornwall: Blackwell publishing.
- Robson, C. 2011. *Real World Research (3rd ed.)*. Cornwall: Wiley-Blackwell.
- Rooter, M., Shook, J., 1999. *Learning to See: Value Stream Mapping to Create Value and Eliminate Muda*. Lean Enterprise Institute, Cambridge, MA.
- Rougoor, C.W., Trip, G., Huirne, R.B.M., Renkema, J.A. 1998. *How to define and study farmers' management capacity: theory and use in agricultural economics*. Wageningen: Agricultural Economics 18.
- Rowley, J. 2002. *Using Case Studies in Research*. Lancashire, UK: Management research news, Vol. 25 No. 1, 21-22.
- Saurin, T., Ferreira, C. 2009. *The impacts of Lean production on working conditions: A case study of a harvester assembly line in Brazil*. Porto Alegre: International Journal of Industrial Ergonomics 39: 403-412.
- Selznick, P. 1957. *Leadership in Administration: A Sociological Interpretation*. New York: Harper & Row.
- Shah, R., Ward, P.T. 2007. *Defining and Developing Measures of Lean*. Minneapolis, Columbus: Journal of Operations Management, Volume 25, Issue 4, 785-805.
- Shimokawa, K., Fujimoto, T. 2009. *The Birth of Lean*. Cambridge: The Lean enterprise institute.
- Sohal, A. S., Egglestone, A. 1994. *Lean: Experience among Australian Organisations*. Melbourne: International Journal of Operations & Production Management, Vol. 14 No. 11, 35-51.
- Stone, K. 2012. *Four decades of Lean: a systematic literature review*. Kansas, US: International Journal of Lean Six Sigma. Vol 3 No. 2.
- Tauer, W.L. 1993. *Short-run and long-run efficiencies of New York dairy farms*. New York: Agricultural and Resource Economics Review 22, 1-9.
- Thomas, B. A. 1988. *Does Leadership Make a Difference to Organisational Performance? :* New York: Cornell University.
- Ulvenblad, P., Wall, A., Cederholm, J., Hedin, E. 2013. *Ledarpraktikan -konsten att leda mig själv, mina medarbetare och min verksamhet*. Halmstad: Bording Halmstad.
- Vidal, M. 2007. *Lean, Worker Empowerment, and Job Satisfaction: A Qualitative Analysis and Critique*. Madison: Sage publication Ltd.
- Womack, J. P., Jones, D. T. 1996. *Lean Thinking: Banish Waste and Create Wealth in your Corporation*. New York: The Free Press.

Womack, J. P., Jones, D. T. & Roos, D. 2007. *The Machine that Changed the World*. London: Simon & Schuster UK LTD.

Womack, J. P., Jones, D. T. & Roos, D., 1990. *The Machine that Changed the World*. New York: Rawson Associates.

Yin, R.K. 2009. *Case study research: design & methods*. London: Sage Publications.

Internet

Swedish board of agriculture, www.jordbruksverket.se

1. *Grön konkurrenskraft- produktivitet i Sverige och i konkurrentländer*, 2014-03-12
http://www2.jordbruksverket.se/webdav/files/SJV/trycksaker/Pdf_rapporter/ovr299.pdf

2. *Annual report 2012*, 2013-11-25
<http://issuu.com/jordbruksverket/docs/130222131430-41d3e9e109ed478394817a6a84cb00b1?e=5119819/3218090>

3. *EAA-Ekonomisk kalkyl för jordbrukssektorn 2001-2012*, 2014-01,28
<http://www.jordbruksverket.se/webdav/files/SJV/Amnesomraden/Statistik,%20fakta/Jordbrukets%20ekonomi/JO45SM1302/JO45SM1302.pdf>

4. *Jordbruksstatistik årsbok 2014*, 2014-07-29
<http://www.jordbruksverket.se/download/18.37e9ac46144f41921cd21be1/1403096030707/Kap+2+F%C3%B6retag+och+f%C3%B6retagare.pdf>

Lean Lantbruk, www.Leanlantbruk.se

Organisation, 2013-11-26

<http://www.Leanlantbruk.se/?p=22201&m=6961>

Appendix 1: Interview guide

Questions to the leader:

1. Give a short presentation of yourself. For how long have you worked at the company? Tell us about your background. (0)
2. Describe your organisational structure? (0)
3. What does an ordinary day look like? How much are you involved in the daily work? Is there any difference from before you implemented Lean? (3)
4. Give a short description of your Lean implementation. (0) Why did you implement Lean? What expectations did you have when you implemented Lean? (4)
5. What is your primary goal with Lean? (Economic, in terms of production, communication, working structure, working environment and motivation)? (4)
6. Please rank
 - a. Three difficulties
 - b. Three key factorswhen working with Lean as a leader? (0/1/2/3/4)
7. How do you anchor new strategies and goals in the company? How do you know that goals are achieved? Do you have sub-goals? What time horizon do you set up for each goal? (4)
8. How good was goals- and strategy management before Lean? (4)

1	2	3	4	5
Very bad				Very good
9. How good is goals- and strategy management today? (4)

1	2	3	4	5
Very bad				Very good
10. How has the leadership changed due to Lean? (1)
11. How do you identify a leader? What are your strengths and weaknesses as a leader? How can you develop? What are important skills for a leader when working with Lean? (1)
12. How do you perceive that your leadership has affected (economic, quality, etc.) results in the company? (0/1/2/3/4)
13. How are you working in order to motivate employees to work with Lean? What difficulties have you experienced when motivating employees to work with Lean? (2)

14. How do you make employees involved to work with continuous improvements and how do you develop your employees? (2)
15. How do you bring problems to surface and do you have any specific strategy to solve these? (3)
16. What has been your most important task as a leader during the implementation of Lean? (1)
17. What are the primary changes or improvements due to Lean? In the short term/Future? (0/1/2/3/4) How can your Lean initiative sustain? (0/1/2/3/4)
18. Do you have any other comments that you would like to add when it comes to work with Lean and leadership? (0/1/2/3/4)

Questions to employee

1. Give a short presentation of yourself. For how long have you worked at the company? Tell us about your background. (0)
2. What is your opinion and how do you experience working with Lean? (0/1/2/3/4)
3. What are the major changes in your daily work, due to Lean? (0/1/2/3/4)
4. What are the difficulties and benefits associated with working with Lean? (0/1/2/3/4)
5. How do you experience that the leader anchors decisions, goals and vision among employees? Do you experience any changes from before the implementation of Lean? (4) How can your Lean initiative sustain? (0/1/2/3/4)
6. How do you describe your leader? What are his/her strengths and weaknesses? What leadership skills do you think are important when working with Lean? (1)
7. How do you experience the leadership before Lean? (1)

1	2	3	4	5
Very bad				Very good

8. How do you experience the leadership today? (1)

1	2	3	4	5
Very bad				Very good

In what way has the leadership changed or not changed?

9. How have your involvement and motivation changed since the implementation of Lean? (2)

10. What factors in the leadership make you more or less motivated? (2)

11. What are the major changes due to Lean in terms of (working structure, working environment, communication and motivation)? (3)
12. How would you describe the relationship between you and your leader and between employees? How can these relationships improve? (2)
13. Do you have any other comments that you would like to add when it comes to Lean? (0/1/2/3/4)

Questions to Lean coach

1. What role do you play as a Lean coach? (0)
2. To what extent do leaders need education to achieve a sustainable Lean initiative? (1)
3. How would you define a good leader? What leadership skills are central when implementing Lean in agricultural firms? (0/1/2/3/4)
4. How would you rank three difficulties and key factors when working with Lean? (0/1/2/3/4)
5. How do you experience the leadership at the company? (0/1/2/3/4)
6. How do you experience that the leadership has affected (motivation, communication, working structure and working environment) results in the company? (0/1/2/3/4)
7. How do you experience that the company anchor goals, strategies and vision in the organisation? (4)
8. How do you experience that the company motivates and coach employees? (2)
9. How do you experience that the company visualize problems and bring them to surface? (3)
10. What is the difference between working with Lean in an agricultural business compared with the industry from the viewpoint of a leader? (0/1/2/3/4)
11. Do you have any comments that you would like to add when it comes to Lean and leadership? (0/1/2/3/4)

0= Introduction

1= Self-development

2=Coach and develop others

3=Support daily kaizen

4=Create vision and align goals

0/1/2/3/4= General comments/concluding remarks

Appendix 2: Summary of Liker's 14 principles

Appendix 2 presents the 14 principles of Lean that Liker has developed. First a short description is given, followed by an explanation of the principle.

Philosophy

- 1. Base your management decisions on a long-term philosophy, even at the expense of short-term financial goals.**

How well is the long-term vision integrated in the whole organisation to prohibit short-term decision-making? The long-term vision is the foundation for all other principles.

Create value for the customer, society and economy. Act responsibly and improve qualities which produce added value.

Processes

- 2. Create a continuous process flow to bring problems to the surface.**

Are production decisions based upon continuous flow and customer demand? Create flow to move material and information rapidly and connect people and processes to bring problems to surface.

- 3. Use "pull" systems to avoid overproduction.**

Do we produce the right product, at the right time and in the right amount? Be responsive to customer demand and eliminate wasteful inventory.

- 4. Level out the workload.**

Can the workload become leveled out? Strive to avoid overloading employees with work.

- 5. Build a culture of stopping to fix problems, to get quality right the first time.**

Is the customer demand prioritized? Is all modern techniques used to secure quality of the products? Use warning systems to detect problems and maintain equipment. Create a culture where products have the right quality right away even if it means slowing down the production.

- 6. Standardized tasks and processes are the foundation for continuous improvement and employee empowerment.**

Are tasks performed in standardized way? Are written used to standardize? Use repeatable and stable techniques to get predictable and regular outcome of your processes.

- 7. Use visual control so no problems are hidden.**

Use simple visual indicators, which can help people to determine whether work according to a standard or deviating from it.

- 8. Use only reliable, thoroughly tested technology that serves your people and processes.**

Support people by modern technology, but do not replace them. Test new technology before using it in daily operation, which decrease risk of disturbance in the value-flow.

People

- 9. Grow leaders who thoroughly understand the work, live the philosophy, and teach it to others.**

Leaders' primary task is to develop a learning organisation. It is of importance that leaders understand the daily work, daily kaizen and teach others the philosophy of the company. Leaders should grow within the organisation, rather than buying them from outside.

- 10. Develop exceptional people and teams who follow your company's philosophy.**

Stabilize a culture where the organisation's beliefs and values are carried out in a long-term. Make a continuous effort to learn individuals to work in teams and towards align goals according to the company's philosophy.

- 11. Respect your extended network of partners and suppliers by challenging them and helping them improve.**

Respect and challenge business partners, such as suppliers, in order to make them grow, develop and improve.

Problem solving

- 12. Go and see for yourself to thoroughly understand the situation**

Go to the root cause of the problem and try to solve it and improve processes. Go and see for yourself the production and make decision based on personal verified data.

- 13. Make decisions slowly by consensus, thoroughly considering all options; implement decisions rapidly.**

Consider thoroughly all alternatives before making a decision. Once, determined a decision implement it quick. Collect ideas and discuss solution with involved people.

- 14. Become a learning organisation through relentless reflection and continuous improvement.**

Become a learning organisation by continuous improvements, waste reduction and stable processes. Design ways of working which eliminates waste and learn by standardize processes. Develop employees and try to make them stay within the company.

Appendix 3 Background of the companies

In this section, backgrounds of the firms that were interviewed is provided. It aims to give a background understanding without revealing the interviewees.

Background 1

The farm consists of 400 hectares of land and operates 200 dairy cows. The company is a family-owned business. Six people are working at the farm, which corresponds to four full-time positions. By implementing Lean the company wanted to reduce waste and improve orderliness.

Leader 1 has worked with agriculture for 30 years and studied 20- weeks of operational management. Approximately 55-65 years old.

Employee 1 has earlier experience from running a dairy farm. Today his/her farm is leased out and he/she has worked at the farm 2 for five years. The respondent has studied 20-weeks of operational management and went to an agricultural high school. Approximately 55-65 years old.

Background 2

The farm is specialized on piglet production and are producing 25 000 piglets a year. The company also operates 100 hectares of arable land and has an integrated production with 23 500 slaughter pigs a year. Eight people are working in the piglet production.

Leader 2 has worked as a manager at the farm for two years. He/she has studies at an agricultural high school and taken some university courses. Approximately 30-40 years old.

Employee 2 was a farmer himself, but has leased out the farm since 1995. In 2005 he/she became employee at farm 3. His/her main responsibility is to work with insemination and breeding.

Background 3

The firm is a family-owned business and is specialized in growing hardwood. The third generation is running the business and in total the company is cultivating 90 ha of arable land with approximately 100 000 trees. The company has 18 employees, which is corresponding to 16 full-time positions. Without too much knowledge about Lean, the company joined aiming to improve working structure.

Leader 3 has three years of university education and has worked in the company for 12 years. Approximately 35-45 years old. Leader 3 inherited the family business from his/her parents and made a generational change. The respondent is in charge of all employees and has responsibility for accounting and decision-making.

Employee 3 has worked 12 years in the company. Totally three years of university education. Approximately 35-45 years old. The interviewee is working with order entry, customer service and administration.

Background 4

Farm 4 is specialized in crop production and seed production. In total the company is cultivating 1 250 hectares of arable land and 800 hectares of forest. There are three full-time workers and one trainee. During peak season approximately twelve people are working and the firm is collaborating with two different farms with labour and machinery.

Leader 4 has a degree in agriculture and rural management programme. He/she started working full-time at the farm in 2012. Approximately 25-35 years old.

Employer 4 has worked at the company since 1976 and has the main responsibility of the crop production. He/she is working a lot with administration and is sharing a lot of responsibility with leader 4. Approximately 55-65 years old.

Background 5

Farm 5 is a family-owned business and it is the third generation who is running a poultry farm with 26 500 hens. At the farm 2,5 people are working full-time and in total 100 hectares of arable land is cultivated.

Leader 5 has been working at the farm since 1998 and three years ago he/she inherited the farm. He/she is an educated carpenter and has worked earlier in the construction industry. Approximately 30-40 years old.

Employee 5 has worked five years in the company. Studied three years at an agricultural high school and took some courses in agricultural and rural management program. Approximately 25-35 years old.

Background 6

The farm is a family-owned business which was inherited in 1991. Today the farm consists of 240 hectares of land, 110 dairy cows, 125 sows and 44 sheep. There are six owners in the company, who all own the same shares. There are six people working full-time and two people working part time.

Leader 6 went on an agricultural high school and has a degree in agricultural and rural management. Approximately 45-55 years old.

Employee 6 has been working at the farm for a year. She/he has a substantial interest in agriculture and went to an agricultural high school. He/she has earlier worked with pig production. Approximately 20-30 years old.