

How to achieve sustainable supply chain in the fur industry ?



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Summary

The consumer's demand and the pressure from the various stakeholders, the concept of sustainability is becoming a hot topic in the business today. The sustainable supply chain management integrate the sustainability in to the supply chain management, the firms should balance the social, environment and economic dimension when making decision. The fur industry, has be discussed time by the industry is natural or sustainable or not, therefore, the overall purpose of this report is to explore how to achieve a sustainable supply chain, focused on the environment and the animal right and welfare issues

In order to answer this question, the research techniques used in this report is case study combination as well as using primary and secondary data, and primary data is collected through interviews and observations.

In order to answer the research question, the first objective is to discuss the currently how the industry implement the sustainability in the supply chain, and define the risks and challenges in the industry. The findings include the environment impact from the fur farming and fur dealing process; the Danish fur farming has pay attention to the animal welfare, but the Chinese mink farming has relative big gap to the animal welfare; the overproduction in the industry caused the waste and large inventory in the supply chain; the Chinese fur manufacturers has low commitment to the sustainability; the traceability does not implement after the auction house in the supply chain. After that , the suggestion for implement the sustainable supply chain is given : 1 the traceability should be expand to the whole supply chain. 2. Open communication with the stakeholder is required. 3. the supply chain should be integrate and increase the information sharing 4.new technology development to reduce the environment from the fur farming and fur dealing process 5. longer life cycle of the fur product through the new market segment menswear and up-cycling .

Keywords: Fur industry, Sustainability, supply chain management

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1.Introduction

1.1the sustainability in the fur industry

The firm in the global environment, it is not only competing with cost , price, service, but increasing requirement m to environment regulations, to satisfy the global consumers, and to reduce all types of waste, both hazardous and non hazardous to improve operating efficiency, and to mitigate the environment impacts of the production(Rao,2008). For firm to thrive it is increasing imperative that it be ware of economic, environment and social dimensions of the whole supply chain , that it has to be monitored and managed.(Bourchery, etc, 2017)

Seen as the one of the most polluting industries in the world, the fur industry is large experiencing criticism by NGOS, consumers and politicians. At present , there is hot debate on the "natural " and sustainability of the fur industry , the two concerned seem to be contradictory in every aspect, no other materials divides public opinion in the same way. Some organization such as Fur Trade Federation believes that fur is natural and durable product, as it's an animal product and can lasts for many decades¹.Another opposite side is the environment and animals protection organizations , PETA is one of the most influential. According to PETA , The clothing made from animal's skin or fur is not "natural ", fur is only natural when it's on the animal born with it. Fur is not like any other fabric, the journey of finished product begins with animals, which are killed for their pelts. The fur industry cause the suffering and deaths of millions of animals each year, and the production of fur contributes to climate change, land devastation, pollution, and water contamination. They Criticize that the fur production harm the environment in the fur farming, fur processing, and transport process, This part will discuss the detail in the following section.

Currently in the fashion industry, it is also deeply divided on whether to participate in the global fur trade. Where on the one hand, 100 % fur-free fashion companies like Stella McCartney, Tommy Hilfiger, Calvin Klien and Ralph Lauren are setting an example in the fashion industry(Ramchandani and Coste-Maniere, 2017) Selfridges , British Vogue Tommy Hilfiger ,. H&M Group, Inditex (which owns Zara), American Apparel, Topshop and Zalando are

¹ Is the fur sustainable ? Guardian sustainable business, reviewed 2017.04.06 available at : <https://www.theguardian.com/sustainable-business/sustainable-fashion-blog/is-fur-trade-sustainable>

all part of the Fur Free Alliance's Fur Free Retailer Program. Some of them are under the pressure of PETA². But on the other hand, companies like Gucci, Donna Karan and Karl Lagerfeld have made fur as their forefront in the fashion shows and use fur as the raw materials(Ramchandani and Coste-Maniere, 2017)

1.2The importance of China and Denmark in the fur industry

On count of the trend of globalization and multiple national operation, if we investigate an industry, it is not enough to discuss only one tier and one region or one country of the supply chain. In the fur industry, Europe particularly Denmark accounts for a major share of world production and export of raw fur skin, and China accounts for the major part of the subsequent processing (Hansen 2016).

Denmark and China play significance importance role in the upstream and downstream of the fur supply chain. According to Hansen(2016), 85% of the world's fur trade originates from farmed species that have been domesticated. Denmark is the leading mink-producing country, accounting for approximately 28% of world production. Other major producers include China, Canada, Poland the Baltic states, and the U.S. China's own mink skin production is still under development, the quality of the fur skins is so low that the price of the Chinese domestically produced mink skin is approximately 40 percent lower than the Danish price, therefore the Danish export of mink skin is very important for the whole supply chain of the Chinese fur industry. China is by far the largest markets for fur skins, China is important as a buyer, a processor.

China has become an economic, and market superpower, and is extremely important for the Danish fur industry(Hansen 2016). Mink fur skins account for over 30 percent of the increasing Danish export of China and Denmark alone accounts for over 60 percent of China's import mink fur skins. In this case one company, the Copenhagen Fur, which cooperatively owned by the

² Is the fur sustainable? Guardian sustainable business, assessed at 2017.04.06 available at : <https://www.theguardian.com/sustainable-business/sustainable-fashion-blog/is-fur-trade-sustainable>

Danish Fur Breeders Association, account for such a large proportion of a country's imports. The exported unprocessed mink skins (9832 Million DKK) are 6-7 times as important as the Edible pork offal, frozen (1489 Million DKK) which is the second product in the list of the Danish export product to China. (2013).

According to Hansen (2016), In the global fur industry, China has two roles:

Firstly, China is the most important country in the world in terms of the processing and sewing of fur garments. The same as the other garment sector, one of the features of the fur garment producing is that wages continue to be the most cost factor (Hansen 2016, Skov 2002). As the labor intensive, therefore the fur garment manufacturing has moved geographically to low wage countries, such as China. (Hansen 2016, Skov 2002). It is also because the traditionally strong markets of Europe and North America, which were influenced by the growing popularity of anti fur and animal rights campaigns against wearing pelts. From the middle 1980s, the global fur centre for the fur trade and fur purchasing has shifted from Western Europe, especially UK and Germany and North America to the Far East, especially China (Hansen 2016).

Secondly, China's center position in the fur trade is being driven by the domestic demand. China is a growing consumer market for the fur garment product. Even though China is still a developing country and the average income in China is relatively low in terms of the average purchasing power per capita, but as the big population, the middle class in the Chinese society is still a big number. (Hansen 2016). According to Hansen (2016), the Chinese consumer approximately 15 million mink coats, assuming that a mink coat needs 15 mink pelts, therefore the Chinese market consumes 22.5 million mink pelts per year. China is also the main export for the fur garment, every year 45 million fur skins used for the export market (Hansen 2016).

1.3 The research question

The environment problem is no doubt that is the most challenge for the human. As the hot topic of pollution, global warming, over production, Natural Resource Depletion, Waste Disposal, the manufacturing are starting to realize that the supply chain must be re-designed and firms are considered to be the highest contributor to environmental concerns. Together with the requirement from various

stakeholder, governmental pressure(decrees, laws, norms/ standards, etc),and social pressure (reputation/image, protection, etc), all of those factors push firms into considering the environment and social issues when they make the supply chain strategy. (Morana 2013,Seuring and Muller2008)

Sustainable supply chain management has emerged as a growing topic, receiving increasing interest in the sustainability and supply chain management area. Due to the negative environment impact to nature and social impacts through the life cycle from fur farming to end product consumption, sustainability is one of the key issues facing the fur industry today(Kozlowski, etc 2015). the fur industry is under pressure to re - examine their purpose (Hick ,2000) and implement strategies to reduce the environment sustainability(Sarkis ,2000).

With the above background, the research question for the report is

"How to achieve a sustainable supply chain in the fur industry ?"

, in order to answer the question, the research applied the steps approach developed by Cuthbertson etc (2005).

The objective 1. what is the challenges and risk for the fur industry to implement a sustainable supply chain ?

In this sub question, which focus on the strategies, the sustainability practices and the associated resources and capabilities in the supply chain to identify the risk and challenge the industry facing . The assessment of the attribute will help to resign the supply chain in the second objective.

Objective 2.How to re-design the supply chain in the fur industry to achieve sustainability ?

the aim of this sub-question is, based the existing supply chain strategy, institutes a strategy change and re-design the supply chain to achieve sustainability in the supply chain.

1.4 The scope of the report

- The fur industry facing sustainable problems. General debates about fur industry sustainability often focus on the environment impacts and the animal right and welfare. The same as the other garment industry, the fur industry is also criticized

about the social dimension such as working condition, labor rights. However, the social dimension is not in the scope of this research, this research will mainly focus on the environment sustainability and the animal rights and welfare in the fur industry.

- The research question of this report is examine how to achieve a sustainable supply chain in the fur industry. In the research, the supply chain , the supply chain Danish fur farmer ,auction house , the Chinese fur processor, the wholesaler , retailer, the end consumer in the Chinese market is chosen to answer the question.
- There are various type of fur : mink, rabbit, fox, raccoon, seal. But in the report , the mentioned fur, is particular to farmed mink skin, as the mink skin account for 90 % of the skins in Kopenhagen Fur auction.

1.5 The structure of the thesis

In order to answer the research question, the thesis is organized as follows :

Chapter 1: Introduction

This section is presented the research question and the primary objective of this study , with an briefly introduction that provided background information about the sustainability concept and the fur industry

Chapter 2: Literature Review

This chapter introduces the sustainability definition and concept , and identifying key issues with sustainability implementation integrated with supply chain practice. In order to answer the research question , green inventory management, green purchasing, traceability in the supply chain have been reviewed.

Chapter 3: Research Methods

The research methods is introduced in this chapter. According to research question type , case study was selected as research strategy. Both secondary data and primary data are used in this research, and data collection methods is introduced with an analysis about the reliability and validity of the research method.

Chapter 4. the supply chain practice in the fur industry

Analysis the step of fur industry supply chain from the upstream Danish farmers through auction house to the fur manufacturers and the end consumer in the Chinese market. In addition, the important stakeholder and expectation from the stakeholder is presented.

Chapter 5: Findings

Through applied to the primary research data according to interviews and authors' observations, to explore the challenges that the Chinese fur industry face for implementing sustainable supply chain, It outlines key issues and drivers for sustainability in this industry

Chapter 6: Suggestions and recommendations

In order to answer to second question, `how to overcome the challenges and how to achieve the sustainable supply chain, both literature reviewed and previous findings of the case study will be mentioned . After that, key success factors for implementing sustainable supply chain will be illustrated.

Chapter 7: Conclusions

In this section, each of the objective question will be answered in details. Further studies will also be outlined.

2.Theory

2,1 The concept of SSCM

The topic of sustainable supply chain management (SSCM) has received attention from a variety of researchers over a span of three decades. According to Dyllick and Hockerts (2002), SSCM is comprehended as the integration of sustainable development and supply chain management. To prepare the groundwork for the SSCM literature review, key terms sustainable and supply chain management will be defined in the following:

In order to address the growing concern about the consequences of the acceleration deterioration of the human environment and the nature resources, the World Commission on Environment and Development published "Our Common Future", "development that meets the needs of the present without compromising the ability of future generations to meet their needs." known as the Brundtland Report, it was the first report to focus on global sustainability and laid out the concept of sustainability as containing environment, economic and social aspect (WCED, 1987). According to Elkington (1994), The concept of sustainability is integration of environment thinking into every aspect of social, political and economic activities, and have to balance economic, environmental and social goals.

Mentzer (2001) defined: "The supply chain is a set of three or more entities (organization or individuals) directly involved in the upstream and downstream flows of products, services, finances, and/or information from a source to a customer. A supply chain encompasses all activities associated with the flow and transformation of goods from raw materials stage (extraction), through to the end user (Mentzer, etc 2001).

Hugo (2011) has described "the supply chain management is the coordination of production, inventory, location and transportation among the participants in a supply chain to achieve the best mix of responsiveness and efficiency for the market being served." According to Lambert and Cooper, "Supply Chain Management is the integration of key business processes from end user through original suppliers that provides products, services, and information that add value for customers and other stakeholders".

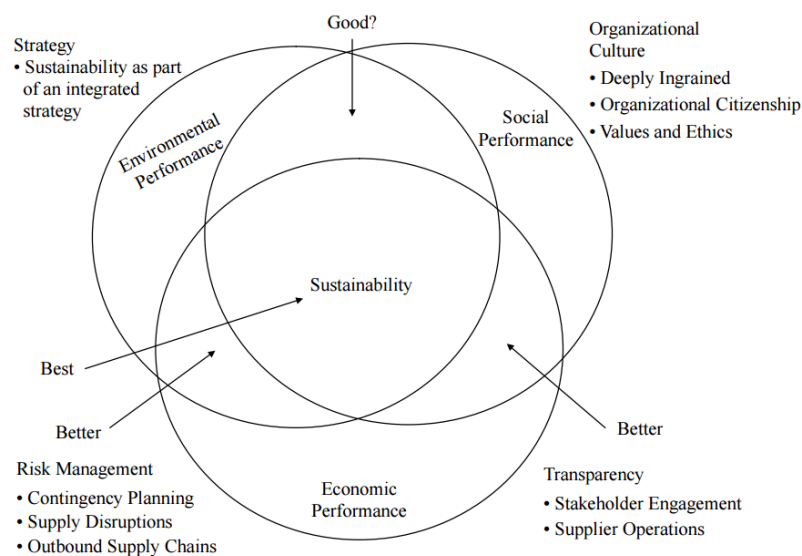
The supply chain management, from the literature review, different authors have different definition. but all with the same direction: the quest for cooperation and collaboration to ensure and improve the performance of each company included in a supply chain (Morana 2013).

Based on those definition, the supply chain management have following characteristics as a management philosophy(Mentzer, etc 2001) :supply chain management view the supply chain as a whole, and to managing the total flow of goods inventory from the suppliers to the ultimate customers; and supply chain management is customers focus , always " put the end customer first" ; The key point represented in the literature are cooperation, coordination, integration and collaboration(Cooper and Lambert 2000, Hugos,2011). Cooper and Lambert (1997) emphasis the importance of integration of processes from sourcing , to manufacturing, and to distribution across the supply chain. In related integrated behavior, mutually sharing information among supply chain members is a key factor to success supply chain management.

In about the mid-1990s, the major stream of research on sustainable supply chain management started (Seuring and Muller2008)

In recent years, a number of literature reviews of SSCM have been published (e.g. Carter & Rogers, 2008; Seuring & Müller, 2008; Carter & Easton, 2011;). According to Seuring & Muller (2008), sustainable supply chain is “the management of material, information and capital flow as well as cooperation among companies along the supply chain while taking goals from three dimensions of sustainable development, i.e. economic, environmental and social, into account which is derived from customer and stakeholder requirements”. This definition have the advantage of inspired research on supply chain and combine with the three dimensions of sustainability, and emphasized the importance of cooperation among supply chain partners, and where there is a balanced between fulfill the environmental and social criteria , competitiveness can be maintained through meeting customer needs and economic criteria (Seuring and Muller 2008).

Seuring and Muller’s definition has the advantage , However, the shortcoming is that the two authors appear to consider the clients or the end customers as being separate from the stakeholder(Morana2013). Carter and Rogers (2008) emphasize on the framework comprising the concepts of both sustainability and supply chain management , define SSCM as ‘the strategic, transparent integration and achievement of an organization’s social, environmental, and economic goals in the systemic coordination of key inter-organizational business processes for improving the long term economic performance of the individual company and its supply chains’. Based on the triple bottom(Elkington,1994) Carter and Rogers (2008) developed the SSCM framework which focus on how to balance the trade off between economic, environmental and social sustainability.(see Figure 1)



culture . _____

Figure 1 - Sustainable Supply Chain Management

(Source: Carter and Rogers, 2008)

Carter and Rogers' (2008) SSCM model in Figure 1 which is based on the 3Bl concept and four different supporting categories of sustainability that include risk management, transparency, strategy and organizational cultural :

Risk management: Risk management is a part of sustainability. According to Carter and Rogers (2008), there are various supply chain risk , can be defined such as the natural disaster, poor demanding forecast, and failure to coordinate requirement across supply chain, poor environment and social performance, fluctuating prices for key raw materials , etc(Carter and Rogers, 2008).

Transparency : Transparency in the framework includes reporting to stakeholders , engaging stakeholders and using the feedback to improve supply chain process. Transparency can be achieved through vertical collaboration across a supply chain as well as horizontal coordination across networks(Carter and Rogers ,2008).

Strategy and culture : According to Carter and Rogers (2008), the sustainability initiatives and the corporate strategy must be closely integrated , and the organization have to have culture and mindset.

2.2 The dimensions of the SSMM

To implement supply chain management, the potential impacts of across three key dimensions has to be understood : social, economic and environmental, as summarized below. These impacts should be considered related to business partners, supply chain and external environment (Figure 2). Each dimension, social, economic and environmental can be further divided into three sub-dimensions. (Cuthbertson etc, 2011) In the next section , will give a detailed discussion of each of the aspects----economic, environmental and social.

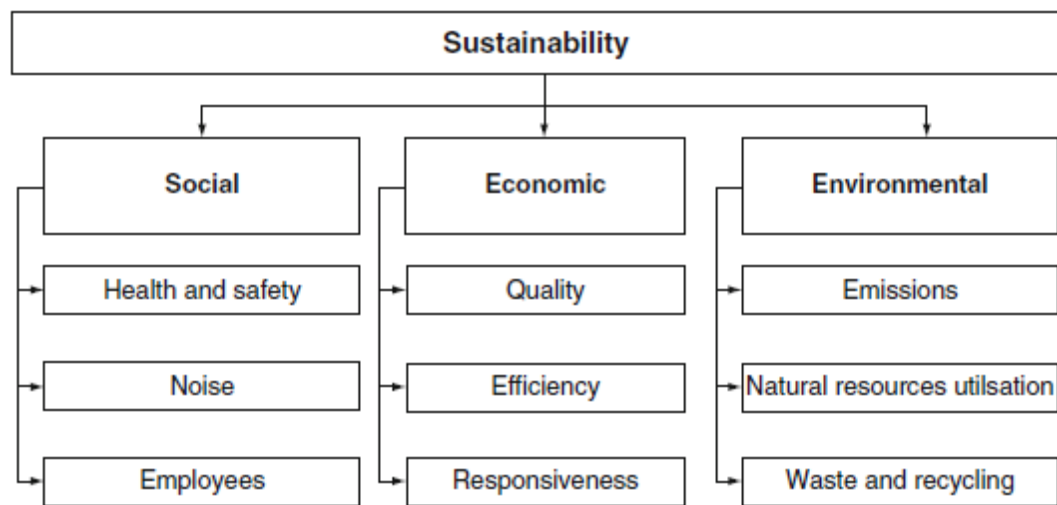


Figure2: Metric dimension and sun dimension. source :Cuthbertson.etc,2011)

2.2.1The economic dimension

Economic performance is a pillar of every company's activities. The economic dimension is the most important when consider sustainability, as positive economic impacts increase the likelihood that the company 's operation can be continued and to be sustained, There is no doubt that a company should be profitable in order to be sustainable in the long-term(Cuthbertson, etc 2011).

From the figure 2., In the economic dimension, include : quality, efficiency and responsiveness. Quality refers to the quality of the product and the service level, meet the customer needs and make the customer satisfaction is the key issues to gain long term profit. The quality performance is measured by no of stock out, customer response time, product lateness , on time delivery , delivery reliability m customer satisfaction, customer complaints and product available(Cuthbertson, etc 2011). .

Responsiveness, the second factor, reflects to flexibility, how a company can respond to customer needs and a changing environment, mostly related to the product availability in the supply chain. Responsiveness performance can be measured by time to market, product flexibility in track and trace performance, order cycle time, order flexibility, demand forecasting, response time. (Cuthbertson, etc 2011).

Efficiency, refers to utilization, productivity and cost reduction. It can be measured by the cash to cash cycle, inventory level, inventory utilization, delivery cost, ROI (Cuthbertson, etc 2011).

2.2.2 Environmental dimension

In the last section explained that the economic dimension is primarily related with profits and the long term company existence, then the environment dimension is focus on the negative impact to the environment caused by the firm's operation and activities on the natural environment. From the figure 2, there are three sub-group in the environmental dimension: emissions, natural resources utilization, waste and recycling. This includes reduce CO2 emission as reflect to the climate change. The environment dimension include the reduction nature resources utilization – Reduction fuel consumption, water consumption and land use. Waste and recycling is another category related to the impact on environment. This can be reflected by the waste reduction, product recycled, Bio degradable materials used. (Cuthbertson, etc 2011).

2.2.3 Social dimension

According to Cuthbertson, etc (2011). People and their skills and their impact on society are key issues in sustainability. Social dimensions include: Health and safety, Impact on employee, Noise emission.

2.3 The animal welfare and Animal rights

There is increasing attention being paid to the animal welfare and animal right worldwide by media, government, scientific research, and especially the NGOs. There are fundamental differences between the animal rights philosophy and animal viewpoint. Animal rights advocates reject all animal use, no matter how humane, humans and animals as essentially equal and condemns any and all use of animals for human benefit (Fur commission, USA).

Planntin (2015) list several definitions regarding the use of animals in connection with the fashion and lifestyle industry. these definitions developed by philosophers and organization are often used as the guidance and standard on animal welfare. Based on those definition, the animal welfare include (Planntin,2015) :

- the physical and mental health where an animal is harmony with the environment surroundings (by Hughes ,1988)
- the animals should live without suffering in an imposed environment
- the animal welfare also include ethical issues such as keeping animals caged or killing them regardless of their living conditions
- maintaining appropriate standards of accommodation, feeding and general care, the prevention and treatment of disease, and the assurance of freedom from harassment, and unnecessary discomfort and pain.

It is no doubt that the animal welfare is an important topic, but currently there is no an agreement on the ethical standards and a code of conduct in industrial production(Planntin,2015) .

2.4 The Supply Chain Strategy: A Critical Success Factor for Sustainability

Carter and Rogers(2008) mentioned the poor demand forecasting , failure to coordinate demand requirements across the supply chain ,fluctuating prices for key raw materials those main supply chain management issues are the risk to achieve sustainability. According to Cuthbertson etc (2011), The effective supply chain management is a key to companies gain competitive advantage and have significant impact to the social , economic and environment performance of a firm, therefore a sustainable supply chain strategy is one of the most important success factors for implementing sustainable development of a firm. Sarkis (2006) define that supply chain operations are key to boosting sustainability performance. According to (Bouchery 2017),Due to the trends of increasing globalization and a shifting focus to competition among networks of partners, the field of supply chain management has become an increasingly central domain in the business. Therefore the genuine improvement in sustainability outcomes ultimately require changes in the supply chain. In the next section , will discuss the green inventory management, green purchasing, green logistical, green transport, that those authors defined in their research to achieve green and sustainable supply chain. The specific challenges and opportunities vary by industry , in the fur industry, the sustainability issues recycle, reuse and transparent and traceability in the supply chains will also be discussed in the following section.



Figure 3 :Three areas to integrate source : Cuthbertson etc (2011)

2.4.1 Green purchasing

According to Sarkis (2006), The green purchasing have to consider the tradition supply chain management supplier selection criterion, which involve of efficiency, quality, cost reduction, on-time delivery, should also include specific measurement regarding the environment practice of the supplier, such as ISO certification involvement in pollution prevention and waste - reduction programmer, hazardous waste management, and the meeting of environment measures. Thus, more information and requirement will be assessed to make the supplier - selection decision(Sarkis 2006).

Sarkis(2006)s implies a framework for selecting and developing an environment supplier. In his research, he believe that the support from top management is a key to select and develop an environment supplier. the need for a an environment programmer through management's desire to improve the firm's competitive position or in response to specific threats to the firm. The recognition of the need for a programmer is then transformed into a set of corporate and environment objectives(Sarkis,2006).

2.4.2Manage the capacity to demand and supply

Cuthbertson etc (2011) define that the sustainable supply chain network should best level the capacities to match the supply and demand to avoid unused capacities and overproduction result in poor efficiency and hence sustainability performance. The firms in the supply chain should plan the capacities to the demand in order to produce the right product for the right customers at the right time and at the right amount. The utilization of capacity is determined by the supply from the suppliers and demand from the market .

The capacity is influenced by the long term and precise demand forecasts, are essential for an effective management of capacities and infrastructure. The sales teams has to anticipate the demand

forecast to the future, therefore the company is able to hear the relay need of the market carefully(Sarkis 2006) .Demand forecasting and planning is an effective management way to match the capacity to reduce waste. According to Hugos(2011) , there are four variables that determine how is the market condition will be : the supply, demand, product characteristics and competitive environment.

According to Cuthbertson etc (2011) ,Adjusting supply and demand is mainly done through instant information sharing. Allowing an intense information flow between supply chain partners requires close relationships between the company and other partner in the supply chain. Therefore the information and technique for sharing information through the supply chain is vital to the capacity management.

2.4.3 Green inventory management

Inventory is spread in the each stage of the supply chain and includes everything from raw material to work in process to finished goods that are held by the manufacturers, distributors and retailers in a supply chain(Simchi- Levi 2001). According to Simchi-Levi etc (2001), there are 3 types inventory can exist in the supply chain :

- Raw material inventory.
- Work-in-process (WIP) inventory.
- Finished product inventory.

There are various shortcoming for hold inventory, one of the disadvantage is the holding cost. Holding cost are the cost to maintain inventory, which include cost of capital, warehousing cost, insurance and other expenses. (Prater and Whitehead,2013)

Managing the inventory is vital important for achieving efficient and sustainable supply chains. Green inventory is characterized by combine the traditional economic focus with the environment considerations (Marklund, 2017). In green inventory management, the profit focus is complemented with the environment perspective. The holding items in stock and each step of the supply chain caused the emissions associated with the energy consumption of operating the inventory facilities and handing the items, The emissions associated with holding items in stock are clearly connected to the energy consumption of operating the inventory facilities and handling the items, and the

discarded items and waste. Therefore the cost of holding items in stock is undisputed to have impact to the environment (Marklund, 2017).

2.4.4 Transport

According to Chopra and Meindl (2016), transportation is another driver with which firms can adapt to improve environment performance through resource reduction as well as emission reduction. Through the innovation design of the transport network and restructure the product and supply chain, the company can lower the transport cost also trend to reduce fuel consumption and environment damage, as well as emission and waste generated from transportation (Chopra and Meindl, 2016). The product design with reducing packaging and allowing greater density can also play a significant role in reducing transportation cost and emission. A well-known example is IKEA, IKEA design the products can be shipped flat to achieve high volume and weight, the benefit is not only reduce the transportation cost, but also reduce emission and energy use. (Chopra and Meindl, 2016)

2.4.5 Traceability and transparency in the supply chain

In their 2008 literature review on sustainability, Carter and Rogers (2008) identified transparency is one of the four supporting facets of supply chain sustainability. Increased transparency is in part being driven by the rapid speed of communication and improvements in software, transparency can be achieved through vertical collaboration across a supply chain as well as horizontal coordination across networks (Carter and Rogers 2008).

UN Global Impact published "a guide for traceability, it revealed that traceability is a tremendously impactful tool for advancing sustainability objectives", and they define definition of traceability as follow :

" The ability to identify and trace the history, distribution, location and application of products, parts and materials, to ensure the reliability of sustainability claims, in the areas of human rights, labor (including health and safety), the environment and anti-corruption ay to go before it is an integral part of sustainable supply chain management and is used widely by companies".

A supply chain traceability system means keeping records of products information between chain parties and shares such information throughout the supply chain so that each unit/batch of a product/component is traceable and traceable(Dai 2015). According to ISO 9000, traceability is defined as “the ability to trace the history, application or location of that which is under consideration”. It is also specified that traceability should consider the origin of raw materials and parts, the condition under which they were produced, the distribution and the final location of the product. An optimized and sustainable supply chain necessarily requires taking into account the traceability(Germani et 2015) . Based on the literature review, And traceability system is only acceptance and implemented in a few industry, mostly discussed the traceability system in the food or food industry, as food traceability is required in most developed countries. the traceability in the other industries, it often fall apart even if a powerful player in the supply chain imposed such a system. According to Dai (2015), the major issues ,that is a traceability system is often very complex which involves a variety of design of decision , though it is difficult for chain members to understand and quantify the cost and benefits of a traceability system . To implement a traceability system, that require all members in the supply chain in to the system and optimizes the system efficiency, clarify the costs and benefits for each member to make the optimal choice(Dai 2015).

2.4.5.1 The RFID framework

In Kang and Lee (2013) ´s research, presented the RFID (Radio Frequency Identification) Framework. According to Kang and Lee, traceability is a key can be used all products and all types of supply chains, implement a RFID technology system can guarantee the complete traceability of raw materials, semi-finished parts and final products. To implement the system, the supply chain partners have to effective share all necessary date in order to certify the products in terms of environment sustainability or social sustainability, as well as to guarantee the traceability. (Kang and Lee, 2013) The implementation of the proposed system at different productive steps guarantees the possibility to effectively model the whole supply chain and to characterize each node of the network in terms of resource and energy consumptions. According to Germani,etc (2015), To implement the RFID system in a supply chain , require each partner partners in the supply chain collaborate, the key success factor is the participant need a mutually agreed method of event data exchange. The RFID system can improve the supply chain optimization, product safety, better pool management, and improved customer service(Germani et 2015)

2.4.6 Recycle and up-cycling

According to Bouzon and Govindan (2015), reverse logistics (RL) practices is a very powerful vehicle to achieve a sustainable supply chain (SSCM) in the fashion industry, which means implementation of used apparel collection programmer. Sas et (2015) defines taking responsibility for end-of-life products can improve company/product “green” image and preempt environmental regulation. According to Carter and Rogers (2008), activities that within the triple bottom line include cost savings associated more effective design for reuse and recycling.

Recycling /up-cycling play a major role in the sustainability criteria of economic, environmental and social dimension((Vermeer 2014). Up-cycling is defined as the act of turning waste materials into a desirable and usable quality objects. In contrast to reusing or recycling, up-cycling uses existing materials to improve upon the original ones. The process requires a considerable amount of creativity and vision, as well as a foundation of thriftiness and environmental consciousness(Vermeer 2014). According to Kellock.J(2017), the benefit of up-cycling include :the first, up-cycling is sustainable, as up-cycling reduces waste by reusing dead stock or gently used materials to create new garments and products; Te second ,up-cycling can be cost effective and less expensive, since used or the pre existing materials are typically a fraction of the cost of newly-made materials and textiles ; the third , up-cycling is creative. In terms of up-cycling requires creativity to envision the potential of existing materials to create something new and beautiful. Remanufacture or re-use can reduce environmental impacts, results in less loss of value, as well as create new market opportunities (Pagell.et)

2.5 Stakeholder theory and sustainability management

The "father of stakeholder theory "Freeman (1987) provide two sense of stakeholder, "the most common one is that the `wide -definition`: those groups and individuals who can effect or be effect by the actions connected to a value creation and trade; and the "narrow definition " includes those groups who are vital to the survival and success of the corporation. In this report, the research use the narrow definition. In his research, the core element managing stakeholder is " managing relationship between the stakeholders", but it does not mean that the all the stakeholder should treat equally, it determined by the special circumstance. the another core element of stakeholder theory is that focus the mutual interests between different stakeholders rather as focusing on trade-off. Freeman(2014) develop the stakeholder framework (figure 4) , the primary stakeholder in the

inner circle, the manager has to pay a special kind of attention to those group. The outer ring of the diagram, is the stakeholder can effect or can be effect by the corporation. the stakeholder theory is seen as one of the major approach in social, economic and sustainable research. According to Horisch (2014), there is links and similarities between the stakeholder theory and sustainability management, and the research group developed a framework to apply the stakeholder theory to the sustainability management. The challenge for managing stakeholder for sustainability:

"strengthening the particular sustainability interests of stakeholders, creating mutual sustainability interests based on these particular interest, and empowering stakeholders to act as intermediaries for nature and sustainable development". To overcome those challenges, key factors are suggested: education, regulation and sustainability based value creation for stakeholders(Horisch 2014).

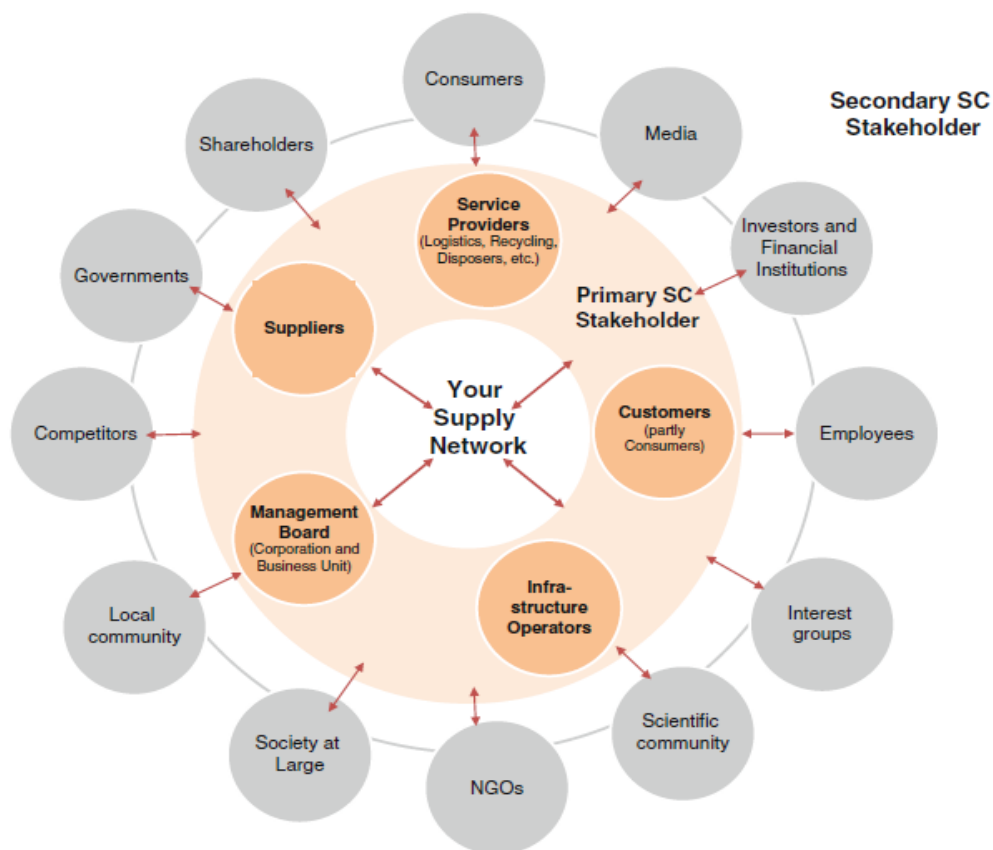


Figure4 :Primary and secondary stakeholders Source : Freeman(2014), Cuthbertson ,(2011)

3 The fur industry

3.1 The fur industry supply chain

According to Porter and Kramer (2006), the value chain can be a particularly useful way to utilize framework of SSCM to identify the environmental and social initiatives, through the primary activities of the value chain to examine the activities such as energy use, hazardous materials, worker safety human rights ,etc. Supporting activities in the value chain such as technology development also relate to SSCM (e.g. relationships with universities to develop qualified supply chain managers), procurement in particular through activities such as asking suppliers to engage in environmental initiatives, ensuring safe and humane working conditions at suppliers' plants, and participation in design for disassembly, reuse, and recycling (Carter and Jennings, 2004). This use of the value chain can enable managers to identify social and environmental initiatives with the

greatest strategic value (Porter and Kramer,2006).

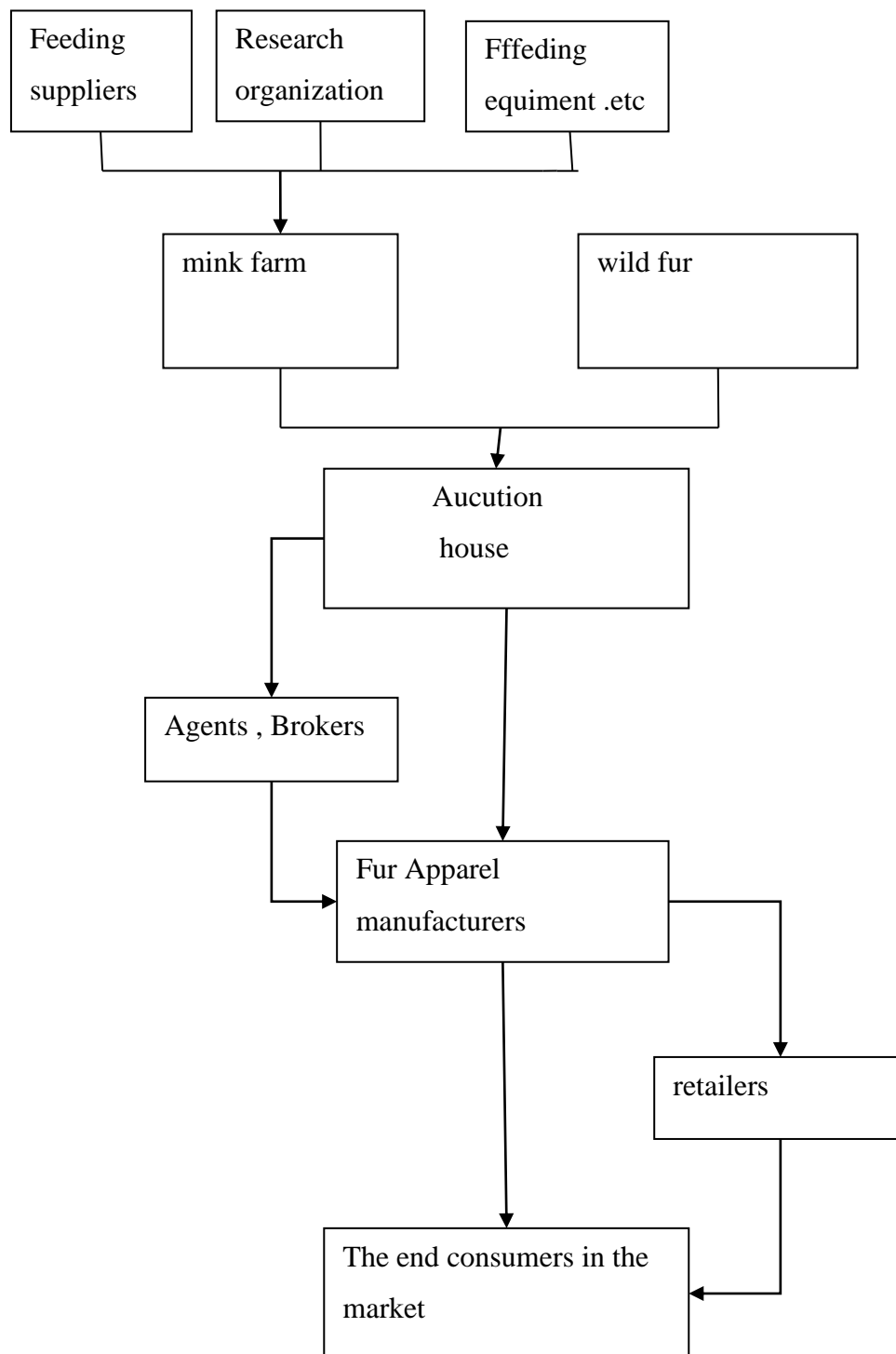


Figure 5: The fur industry supply (source :My own design based on the information from Copenhagen Fur ´s website and my knowledge about the fur industry)

A graphical view of a fur industry supply chain and possible flows among supply chain partners are shown in Figure 5. The chain normally consists of farmers, input suppliers and other cooperative that support mink farmer, auction houses, fur garment processors, wholesalers, retailers and consumers. Additionally, transport companies act as logistics supporters in the supply chain processes.

3.1.1 The feeding suppliers

The quality of the feed can affect the environment burden as well as the quality of mink skin, and feed method can influence the amount of manure produced by the mink animals and promotion animal welfare. In Denmark, the majority of fur animal feed to the mink farmers are unified organized and supported by the Danish Fur Breeders Association, the sustainable activities in this stage include that the has its own research and consulting agency, the cooperation with universities and research institutes co-ordinates and communicates development with fur breeding, the research on the animal health and disease control³.

3.1.2 The fur farming

Mink farmers are responsible for the breeding and agricultural part of the life cycle. Table 1 present the number of the mink farms and production of mink skins by countries in Europe.

Country	NO of mink farms	Production of mink skins
Danmark	1533	17,100,000
Poland	1144	8,500,000
Finland	914	1,940,000
Norway	340	700,000
Lithuana	131	1,500,000
Netherlands	185	4,000,000

Table 1 : Mink production by countries in Europe Source : <http://www.fureurope.eu/>

The sustainability activities in this step

According to Copenhagen Fur ´website, In order to reduce the production of CO₂ to a minimum, all the farming activities take place only on the farm and limiting the feed for transpiration of the

³ DFBA, <http://www.kopenhagenfur.com/about-us/the-association>

animals .Furthermore, all the by- products are used. the animal fats from mink are used in the production of bio-diesell. The rest is fully utilised for CO2 neutral energy, as fertilisers for growing crops and for cement production, etc. Fur animal feed, for instance, uses by-products from the fish and meat industries⁴.

The mink production in China

The Chinese mink production in 2016 was at approx 26 million with a decrease of 60% compared with the highest level in 2014, whereas the production in 2014 was at 60 million.(Figure 6), the mink production in China is relative concentrate, The Shandong Province accounts for 70 % of the mink production , the three province Shangdong, Heilongjiang and Liaoning account for 96% of the Chinese mink production⁵.

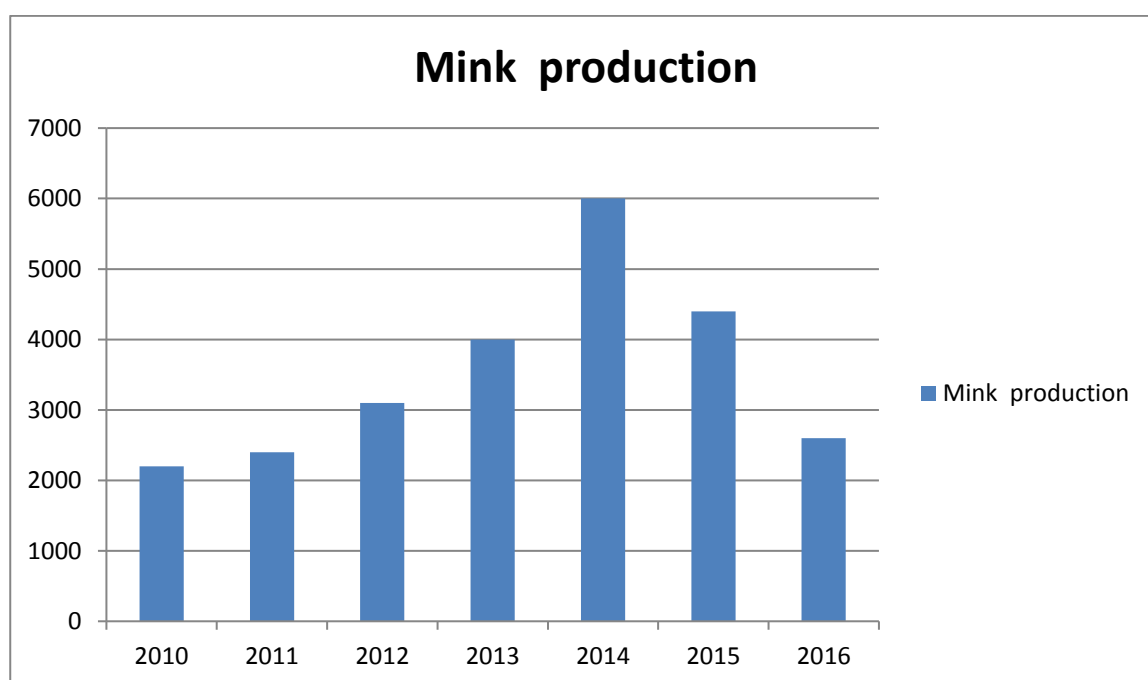


Figure 6 The Chinese mink production from 2010-2016

Source: Chinaleather. org , <http://www.chinaleather.org/>

⁴⁴ <http://www.kopenhagenfur.com/responsibility/environment>

⁵China leather production report , <http://www.chinaleather.org/>.

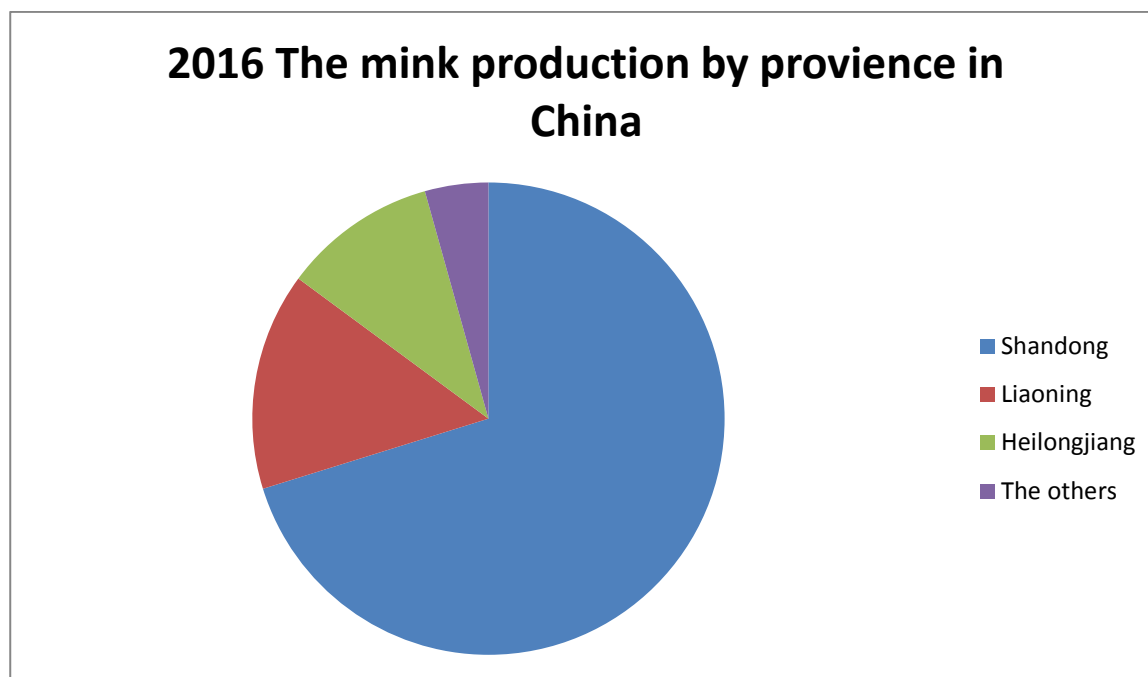


Figure 7 : the mink production by province in China

source: Chinese leather production report, <http://www.chinaleather.org/>

3.1.3 Auctions house

The auction houses works as wholesale and primary distribution in the supply chain. In this stage, fur skins from the mink farms are collected, and the pelts are graded according to the colour, size, type and quality. The process is completely transparency in pricing and costing. The auction sale method can not only garrammtee the mink farmers a fair price for each fur skins but also gives each farmer an overview of the price of his pelts compared to other farmers .

The raw skins are mainly sold through auction houses, There are four largest auction houses, it is Kopenhagen Fur, Sage Fur in Finland, North America Fur auction and American Legend. One of the characteristic of the auction house is that it often located close to the production area, therefore can reduce the energy caused by the transport.

The auction house Kopenhagen Fur have innovative the process to improve sustainability. From 2016, Kopenhagen Fur introduced the live stream of the auction, the customer in China can see the live price in Denmark and contract with their broker in the auction room to purchase the skin. This added value to Kopenhagen Fur which give the customer flexibility of the business, the customer

avoid to take a long journey to Demark as they did traditionally. The result is that increased customer satisfaction and reduce emission occurred by the long traveling.

3.1.4 The fur manufacturers

This part in the supply chain is seen as the most challenging to manage. After the auction, the skin is further transport to be dressed. the fur skins in this step require special chemical treatment to convert the skin into leather and get ready for use in fur garment. the Europe, the processing take places in Greece, germany, Italy, Poland, Lithuania and Denmark. currently much of this process Europe in has been outsourced to China. The European dresser and dyers are subjects to the European Union's REACH regulation (Registration, Evaluation, Authorisation, and Restriction of Chemicals) that is adopted to protect human health and the environment from the risks of chemicals(Planthin,2015) .

3.2 The stakeholder in the industry

According to Bouchery(2017), to achieve Sustainability in a supply chain, it is not only involve the traditional supply chain partners such as customers, employees, suppliers, consumers et, but also involves engaging with a range of stakeholders which out of the organization. The trend is that the firms face more expectation related to sustainability from stakeholder. Firms are expect to be aware of environment and social issues faced by communities around the world tHat are affected by the supply chain. Therefore the firms should take the utilities of a wide range of stakeholder into account when making decisions.

According Freeman (2014), the corporation should define the stakeholders 'role and the position in the industry. In this case, the mink farmers, Customers, employees, investors and politician and NGOS have different expecting from a firm:

The mink farmers as the suppliers in the supply chain, from a stakeholder sense, it is vital to the success of the industry, because the raw material will determine the final product the fur garment 's quality and price.

The fur manufacturers and the end consumers, the fur manufacturers exchange the resource for the products, and the end consumers provide the lifeblood of the supply chain in the form of revenue.

The NGOs' impact in the fur industry expressed by the anti-fur campaign and influence the purchasing of the end consumer, therefore the NGOs is also obviously vital to the survival and success of the fur industry.

The table below present expectation from the different stakeholders.

Stakeholder 's expectation				
fur breeders: marketing support ,continous commucation ,support for improvinf animal stock , added value form certification , reliable grading	the auction customers : reliable grading , traceability , continous communication, animal welfare	employees : Unambiguous management, open commucation	intestors : :Accessibilty, presence, open commucation , revenue -based, stable distribution of dividends, CSR	Politicians, NGOS: Open, transparent communication , reliability of infromation , animal welfare

Figure 8. The expectation from different stakeholder group (based on the information from Copenhagen Fur and SAGA Furs website)

4 Research Method

In the start of this chapter will mentioned the research question, as the research question is the soul of the report, the designed method is to answer the question, then in the next section will explain the research approach, research strategy, data collection method.

4.1 the research purpose

as noted in the chapter 1, the research question is formulated as below :

How to achieve a sustainable supply chain in the fur industry ?

The primary objective :

1. what is the challenges and risks for the fur industry to achieve sustainability?
2. how to re design the supply chain to implement sustainability in the supply chain ?

4.2 The research approach

Saunders(2011) defined the research strategy is a plan how the research will go to answer the research question, there are different social science research strategy , such as experiment, survey, case study, archival research, action research and ground theory, each strategy fill different needs and situation for investigate social topics. How to choose the strategy ? Yin (2014) highlighted that when to use each strategy determined by three factors, which present in Table 2.

Table 2. Relevant situations for different research methods (Source :Yin, 2014)

Method	Form of research question	Requires control of behavioral events	Focuses on contemporary events
Experiment	How , why?	Yes	Yes
Survey	Who, what, where, how many, how much	No	Yes
Archival analysis	Who, what, where, how many, how much	No	Yes/no

History	How, why?	No	No
Case study	How, why?	No	Yes

In this thesis, the case study method is chosen to answer the research question. According to Yin, the first and most important condition for differentiating among the various research methods is to classify the type of research question being asked, the case study is preferred to address the "how " or " why " question and can be used for exploratory , descriptive or explanatory investigation. In this research, the descriptive method will be used to explain the theories , the industry data and the industry current strategy. One of the key objectives is to gain insight into the sustainable supply chain management practice in the fur industry, through understanding how the mink farmers, the fur manufacturers, the retailers interprets and address sustainability, the exploratory method is help to collect data through various method to define the question, in this case , which is gain insight in to the sustainable supply chain management practice in the fur industry. Yin (2014) stated that the specific case should be relevant to the objectives and research problems . The research question is to explore how to achieve the a SSCM in the fur industry, therefore a specific supply chain from the Danish mink farmer to the end consumer in the Chinese market is chose , the reason is that, as the report described earlier, the Danish suppliers and Chinese customer and consumer are the most important player in the supply chain, therefore through investigate the supply chain from the Danish and Chinese customers can help to answer the question.

4.3 Data Collection

After applied the case study as a research strategy in this study, therefore, the next step is to start collecting data that related to satisfying the research purpose and questions. In this research, both primary source and secondary sources of information were used in this report.

4.3.1 Secondary data

There are several type of secondary data. According to Saunders (2011), there are 3 type of secondary data: Documentary, survey, and multiple source. Whether to use Primary date ,

secondary data or both is depend on the research question, the budget, the skills and available resource⁶.. The secondary data used in this report, include different sources of literature like books and scientific papers from Aalborg University's database, organizations surveys, industry statistic and report, the internal newspaper and magazine from Kopenhagen Fur. this data gathered was used as background knowledge of the research, when forming the quantitative and qualitative data about the currently sustainable supply chain practice in the fur industry. Compare to primary data, secondary data is readily available and inexpensive to obtain.

4.3.2 Primary data

Primary data sources were collected mainly by interviews with the fur manufacturers and author's observations.

4.3.2.1 Interviews with the fur manufacturers

The respondent in the interviews is two fur manufacturers from the Chinese market. They are the manger - owner of two small - medium fur garment factory in China. As we mentioned early, most of the fur manufacturers in China is family owed and with small and medium size, The studied firms represented small and medium sized enterprises with 20 and 165 employees. Both of them are owner-managed and with informal and less hierarchical management structures. Both of them are suppliers to wholesale and retail customers. The two fur manufacturers which can represent the situation of the Chinese fur garment industry to address the environment and social performance within their supply chain practice.

Due to having geographical distance with interviewees, there is no chance to do conduct face to face interviews, therefore the research was held via Wechat conference call .The interviews include 14 questions open and yes /no questions(See appendix 1).

According to Saunders(2011), credibility can be promoted through the supply of relevant information to participant before interview, therefore Before the interview, the authors explained an overview of the research project, its purpose and how they will be involved. and a list of the interview themes is provided to the participants. Saunders (2011) stated that the provision of question or interview themes in advance may help to promote validity and reliability , as the interviewee can consider the topic and the answer and organize supporting documentation .

⁶ <http://www.iwh.on.ca/wrmb/primary-data-and-secondary-data>

The interview took one hour as planned before, during the interview, the question be adjusted or adapted in response to any new or interesting fact.

The reliability of the interview

According to Saunders(2011) ,in the qualitative research, reliability is concerned with whether alternative researches would reveal similar information. The trust and credibility will affect the value of information given by the interviewee and raising doubts about its validity and reliability. In this case, the authors developed good personal relationship with the Chinese fur manufactures during the working process in the Kopenhagen fur auction, the interviewer gain knowledge about the interviewee's company information such as the market, customers, financial data and the culture of the group, this type of information can help the interviewer develop the credibility and assess the accuracy of the answers and encourage the interviewee to offer a more detailed information about the topic. Saunders(2011) stated that the cultural will also affect the interviews successfully and to obtain reliable data. In this case, this is almost no culture difference between the interviewee and interviewer. The interview hold by in Chinese, therefore it avoid mistake and misunderstanding occurred by the language difference.

Interviews with Ms Cui from the broker and agent

According to Yin (2011), the interviews as a method to collection data is very targeted which can focus directly the topics and objective of the research. The first two interviewees have answered most of the question, however, the weakness of the interview is also obvious, the first is that sometimes it is reflexivity which means the interviewee gives the response what interviewer want to hear. the second is that, because the interviewee is the manager -owner of the fur manufacturers,, it willing to participate to the interview, but might be sensitive to the certain theme such as the working condition of the employee, the salary. etc. interviewees may therefore choose not to reveal and discuss an aspect of the topic that the research wish to explore., because this would lead to sensitive information that they do not wish, to discuss with you(Saunders 2011)

Therefore the author conduct an interview with a colleague from the broker company, who visit the garment factory frequently, from her observation and point of view, to gain more valid information.

The authors also send email to some NGO regarding the sustainability situation and how to achieve transparent and sustainable supply chain in the Chinese fur and fur garment industry. And one of

the fur manufacturers helped introducing with a third interviewee, Kelly, who works in the International Fur Federation has responsibility for the Asian market. After a few days, Kelly sent back some explanation regarding the Chinese fur industry and her standpoint by Email. Those points in details related to the research objective and will be used directly in the findings chapter.

4.3.3 Participant observation

In Yin's research, he strongly recommended triangulation that uses many different sources of evidence. In a case study using multiple sources of evidence, he stated that using multiple sources of evidence were rated more highly, in terms of the overall quality, than those that relied on only single sources of information.

The complete participant as the researcher attempting to become a member of the group in which you are performing research (Saunders, 2011). According to Saunders (2011), participant observation is not merely a passive observer, but also taking some functional role in the organization setting. In the past 4 years, I have participated in Copenhagen Fur as secretary during the auction period. As Copenhagen Fur implemented the live streaming of the auction in Tongerpu, Beijing, and Yuyao, where customers can view a live stream of the auction and the prices in Denmark. My task is to contact the customers in China and collect the order they want to purchase from the customers through Skype; furthermore, my working task includes developing relationships with the customers who attend to the auction house. Saunders (2011) stated that through participant observation the research can gain the ability to perceive reality from the viewpoint of someone 'inside' a case rather than external to it. Through the observation, I had the opportunity to contact the customers, how they make purchasing decisions, their behavior, their perception and opinion about the skins, the key information of the auction process and the data on my perceptions and feelings. Finally, through participant observation, the research can have the opportunity to use the internal documents, such as the price record in the auction, and produce a greater variety of situations for the collection data.

According to Yin (2014), the strengths and weaknesses of the data collection methods interviews and observation are highlighted below:

Table 3 : The strengths and weakness of using interviews and observations Source (Yin , 2014)

Source of evidence	Strengths	Weaknesses
Interviews	<p>Targeted --- Focus directly in case study topics</p> <p>Insightful---provides explanations as well as personal views (e.g perception, attitudes, and meanings</p>	<p>Bias due to poorly articulated question</p> <p>In accuracies due to poor recall</p> <p>Reflexivity----Interviewee gives what interview wants to hear</p>
Participant Observation	<p>Immediacy ----covers actions in a real time</p> <p>Contextual ----can cover the case's context</p> <p>Insightful into interpersonal behavior and motives</p>	<p>Time consuming</p> <p>Selectivity ----Broad coverage difficult without a team of observers</p> <p>Reflexivity ---actions may proceed differently because they are being observed</p> <p>Cost---hours needed by human observers</p> <p>Bias due to participant observer's manipulation of events</p>

5 .Findings

In this chapter, the report will present the answer to the first primary objection question : how is the challenge for implement the sustainable supply chain in fur industry .

5.1 Criticize and pressure from the animal protection NGOs

There are thousands national and international Non- Government Organizations, many large NGO have multinational organizations with wide reach and influence (Cuthbertson, etc, 2011).For the fur industry, the NGO mainly deal with two topic : the first is that killing animals for their skin is unethical, and the second is the environment issues and animal welfare and animal rights, well know example include PETA (People for the Ethical Treatment of Animals), Respect for Animal.

the fur trade is always accompany with the anti fur campaigns from the animal protection NGOs. There are numerous animal protection NGOs in worldwide , The most famous is PETA and Lynx. they criticize that killing animals and use their skin is unethical. During the 1980s-1990s , Anti-fur campaigns became part of popular culture. They used shocking print ads and videos, to target the middle to upper class who is the main consumers of fur products , in hopes of discouraging consumers from purchasing fur products . By making the fur trade into something cruel they make the public see wearing fur as a signal that support such barbaric practices. The desired effects of these ads were to make people ashamed to wear fur, and to judge wearing fur as morally wrong(Allisonsmf)⁷ . These new attitudes introduced into the public had a devastating effect on the fur industry, more than a decade , fur was disappearing on consumer markets .

5.2 The environment impact from the fur industry

The fur industry is one of most pollution industry, the impact on environment and its effect has become a hotly discussion between stakeholders, scientists, and the public in general(Bijleveld,etc 2011). The most impact to environment is from the fur farming and the fur processing.

5.2.1 Environment impact from the fur farming

Mink farmer are responsible for the breeding and agricultural part of the life cycle, from PETA and AN another animal welfare organization " respect for Animal", they list the sustainable issues in the

⁷ The rise of the anti fur movement , <https://allisonsmf.wordpress.com/2012/03/03/the-rise-of-the-anti-fur-movement/>
Accessed at 24-05-2017

mink farming. In the following section highlight the environment impact from the fur farming, which is summarized from PETA and the NGO "respect for animal" website :

1. The impacts to environment caused by the resource consumed by the mink farming. the feed products including fish, cereals, drinking water and the equivalent energy , the NGOs believe is unnecessary waste as the trend of resource shortage globally.
2. The second is the threat from the feces and waste from animals. according PETA, each mink produces about 44 pounds of feces in the whole life, the feces has the dangerous component nitrogen and phosphorus, which wreak havoc on the local water system. The damage to the environment include increased nitrogenous oxygen demand in receiving waters, ammonia toxicity to fish, eutrophication, and health problems in humans and other animals. The air pollution come from gases released from the mink's manure can have an adverse impact of life of local residents, it can also cause damage to surrounding ecosystems . Ammonia from fur farm has been shown to cause damage to forests by effecting trees and other vegetation directly as well as indirectly via forests soils.
3. The environment impact caused from the transport. The transport occurred in the fur processing include transporting feed to minks, removing animals 'waste, transporting carcasses, transporting pelts from farms to auction house, from pelts to a fur tannery, the tanned pelts to a fur garment factory , then to a wholesaler, and so on. Those transport process produces significant emissions, according to PETA, the energy spent in the transport is much more than the other garment material

5.2.2 The environment from the fur dealing process

The fur dealing process has on the agenda of environment challenges for the last few decade. The chemical process is seen as one of the most toxic practiced by industries. Chrome tanning has been the dominant method of making leather and fur product(PETA). Chromium is seen as an extremely toxic and environmentally damaging waste product from fur industry. The chromium used in the process caused the waste water pollution is the biggest problems(PETA). According to Planthorn (2015), "The environment threat involve the dumping of solid and liquid wastes that

contains leftover chromium and several toxic and hazardous combination of compounds". The challenge face in the process is that the industry has to control the water and energy consumption and to manage its waste materials, however, the tanning process primary take place in Asia where the regions without strong environmental protection standards(Planntin,2015,PETA).

Although in this report the social dimension such as the employee working condition is not in the research scope, but it is impossible not to mention the human and employee in the process. The tanning process are extremely dangerous for the employees, if the employees do not have adequate protection(Planntin 2015).

As the report introduced earlier, China is the largest fur manufacturer , the Chinese government is becoming concerned about the pollution caused by the process, but currently there is no effective laws against the harmful chemicals used(PETA).

5.2.3 Life Cycle Assessment comparison

According to US Environmental Protection Agency (USEPA 2016), Life Cycle Assessment (LCA) is a technique to analyse the environmental impacts of a product's life from material creation to disposal or recycling. The life cycle assessment can provide a transparent overview of the life cycle. According t Planntin (2015), LCA is mostly used to the livestock emissions assessment.

For decades, fur production has been a hotly debated issue in many Western countries. Anti-fur associations point to animal welfare issues, including poor-quality living conditions and have ethical objections to mink being kept for their fur (Bijleveld,2011).

With this background, 3 NGOs from Netherland, Belgian and Italian delegate a independent research orgainzation CE Delf to conduct a life cycle assessment of the fur production. The investigate include two parts: the first is to investigate on the environment impact of the mink production supply chain, which include mink feed production, mink keeping, pelting, fur treatment and transport. The second is to compare the environment impact on the process of producing the fur materials with the other textiles , such as cotton, argyle, polyester and wool.(Bijleveld, 2011; Ramchandani.M, Coste-Maniere.L, 2017)

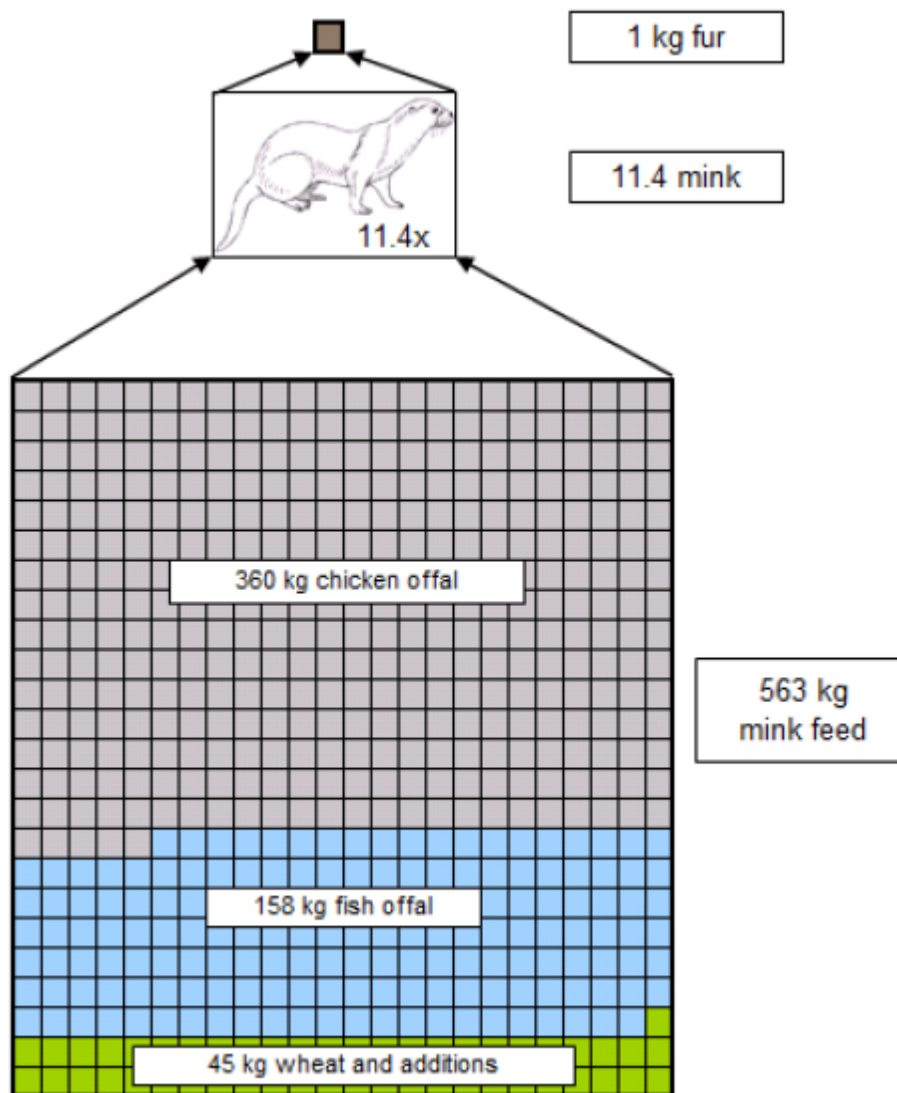


Figure 8: LCA for 1 kg mink pelt Source (Bijleveld, 2011)

The result is that, to produce 1 kg of fur requires 11.4 mink pelts,. In the course of its lifetime, one mink eats almost 50 kg of feed , therefore produce 1 kg fur cost 563 kg feed .(Bijleveld2011;

Ramchandani.M, Coste-Maniere.L, 2017)

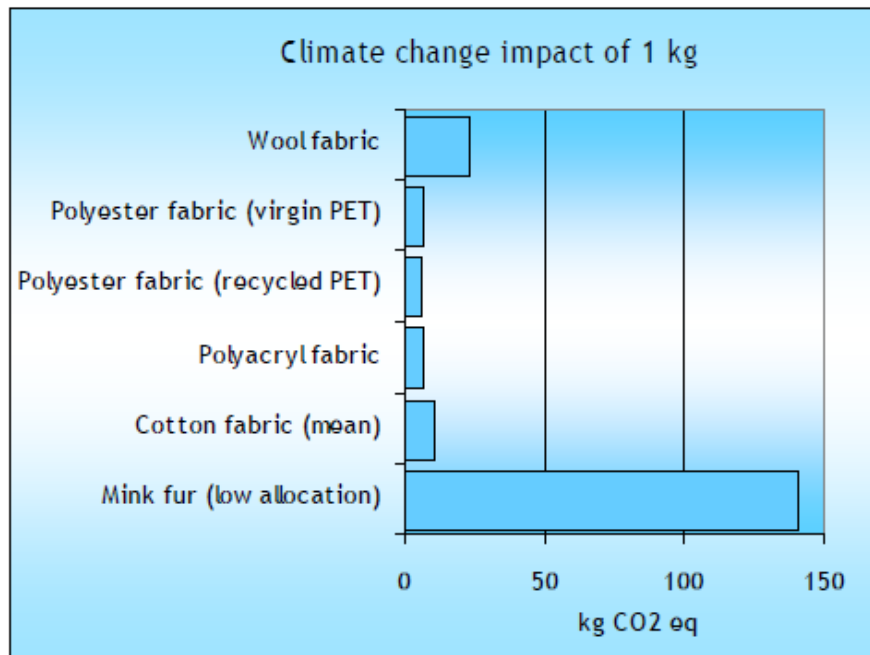


Figure 9 :The climate change impact of 1 kg fur source :Bijleveld2011

According to Figure 9, the climate change impact of 1 kg mink fur is five times than the other garment materials, such as wool, polyester, polydactyl, and cotton. The impact to the environment from the mink production is from the emission of N₂O and the Ammonia from the mink manure(Bijleveld, 2011)

Interesting, the fur trade organization International Fur trade Federation (IFF) commissioned the DSS management consultants conduct a research to undertake a evaluation of the life cycle comparison on the environment of natural fur and faux fur. The comparison between the natural fur coat and the faux fur coat examine the four point indicators: the human health impacts, the ecosystem quality impacts, the climate change impacts and the demand resource suppliers. The result showed that the faux fur coat production has higher environment demands than a natural fur coat production. , the life cycle of a faux fur coat results in considerably greater consumption of non- renewable energy, greater risk of potential impacts of global warming and greater risk of potential impacts from ionizing radiation.(DSS 2012, Ramchandani.M, Coste-Maniere.L, 2017)

5.3 Overproduction in the supply chain

In the literature chapter, it explained that the sustainable supply chain management have to balance the supply and demand to reduce the waste. However in this case, the problem of overproduction exists in the supply chain.

According to Carter and Rogers (2008), poor demand forecasting and failure to coordinate demand requirement across the supply chain, fluctuating prices for the key materials is a part to defining the supply chain risk, for the company to management the economic, environment and social risk in the supply chain .

According to Hansen (2016), the raw fur supply have the characteristic that the fluctuations price caused fluctuation supply. Normally in the cycle that several years of good prices followed by several unprofitable years, but the cycles are difficult to predict. In 2013, the mink price fetch an historical high price , which is almost 50 % than the price before, the primary driver for the increased price is from the increased demand from the middle class in Chinese market and one of the coldest winter in China in 2013. In order to gain more profit, the existing mink farmers expand the production, it also attract new entrants to start the mink farms (Chen, 2016). The price surge prompted the Chinese double their production to nearly 40 million pelts.

The high price in one year lead the unprecedented of mink production lead to the rapidly falling rice. Since 2014, the market changed abruptly, prices plummeted to about half compared with in 2013, the mink marketing has hit by the two biggest market in the downstream supply chain --China and Russia, it is due to the overproduction and a mild winter in China that reduced the demand for mink coats . An economic meltdown in Russia also caused demand there to tumble .

From the tableThe Danish mink farmers produced approx 18,6 million mink in 2015. The number is slightly lower in 2016, but overall the Danish production continues to be stable .The greatest drop in production figures has take place in China where mink farmers produced approx.18 million mink in 2015. that production is now estimated at approx.8 Million in 2016. the production of mink was at its highest in 2013, The decrease the mink production is caused by the sharply decreased in price which is under the total cost of running the mink farm

The overproduction lead to waste in the supply chain, The waste of overproduction is considered as the 7 worst waste in lean manufacturing⁸. The waste is not only regard the discarded fixed asset such as housing , facilities , equipment , but also the feed the electricity, pesticides , vaccines ,antibiotics used for the overproduction minks.

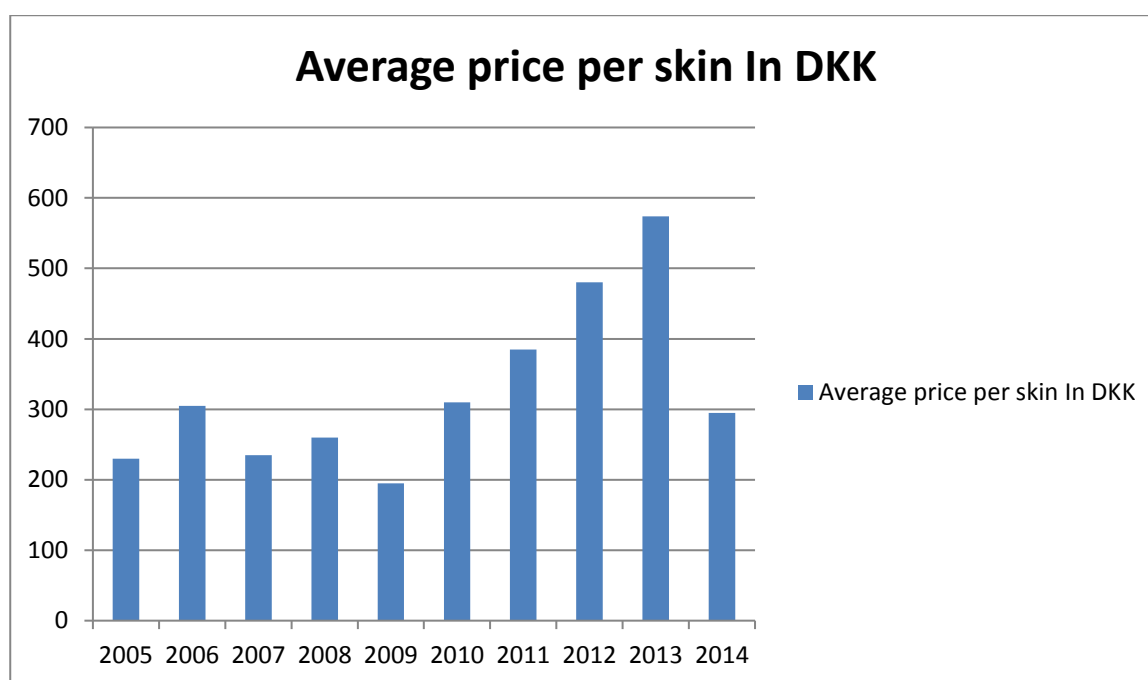


Figure 10 The average price per skin in DKK in Kopenhagen Fur auction source : the salg of skin from the internal report)

Production of mink in millions	2016	2015	2014	2013	2012	2011	2010	2009
World	54	73	82,5	88	64	55	50	47
Danmark	17,1	18,6	18	17	15,6	15	14	14
China	8	18	32	40	22	15	12	10

Table 4 The mink production in Denmark and China from 2009-2006 Source : Kopenhagen fur news

⁸ <http://www.lean-manufacturing-junction.com/waste-of-overproduction.html>

Another waste cause by the unbalanced supply and demand is the inventory in the each stage of the supply chain :

5.3.1 The inventory in the mink farms

In the theory chapter highlight the weakness of improper of management of inventory. Holding a large volume of items means need a large amount of space to store the inventory. especially the raw skins, have high requirement for storage which the raw skins should be storage in the cold temperature. Storage space like warehouses and storage rooms cost money to build, rent and maintain. Another disadvantage is that as the market prices for mink skins decline sharply, some mink farmers choose to keep the raw skins and wait until the market become warmer and the price is more favorable where the skins will be put up for sales. The raw skin has high temperature controlled requirement , to ensure the quality , the skins should store in the temperature under - 18. the energy consumption and thereby emission of holding the skins in stock are much higher than the items can stored in a non -temperature requirement warehouse or outdoors.(From observation).

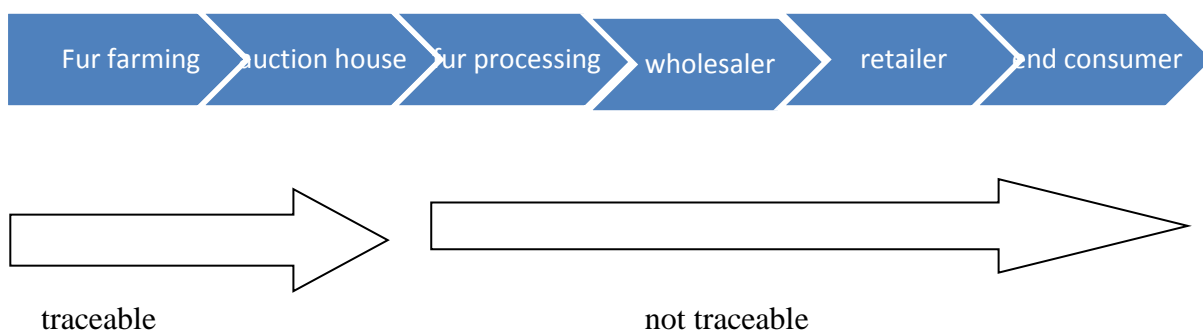
5.3.2 Inventory in the fur manufacturers

According to the interview ,The fur industry is plagued by high inventory for long time, From 1990s , high inventory of raw materials and products has been bothering the industry. the inventory is also caused by the lacking innovation and design for the fur manufacturers and blindly follow the fashion. The result is that the similar raw materials and suppliers caused similarities limit each fur manufacturers 's ability to be price or product focused, therefore the product compete by better quality but with the lowest price ,The imitating caused the unsold similar product in the market caused in inventory .

5.4 The traceability in the supply chain

Ensuring transparency in the fur trade have to involve all parties of the trade from the farmers, and auction houses, via brokers and customers, through dressers, dyers and manufacturers . The supply chain transparency can be eliminated if the supply chain is globalization and the delocalization of production in the developing countries (Kozlowski,etc 2015).

The traceability programmer discloses the proportion of certified farms, dates of farm certification and the countries of origin after the auction, when the skins be sold and transported further to the buyers(SAGA Furs, 2015). According to the interview and the `Kopenhagen Fur news`, currently the supply chain is not fully integrated and communicated, the transparent and traceability of the material processes is only in the stage from mink farmers to the auction house, after the auction house the skins are transported and delivered to the next step of the supply chain, mostly in China, as the different market conditions, the rest part of the supply chain in the fur industry is still non-transparent for the end consumers and stakeholders. To ensure sustainable in the whole supply chain, the fur process such as dyeing and dressing is also demanded for transparent, the industry have to find a solution to enable the individual pelts can be traced during the dressing stage and fur garment produce, wholesaler until the end consumer.



5.5 Top manager has low commitment to sustainability

According to Cuhbertson etc (2011), they key to implement a sustainability supply chain is the people who make the decision in the supply chain, it directly influenced the selection of the supply chain partners such as suppliers. Therefore the top management's commitment is crucial for the company to pursue sustainability, especially the profit and financial result many not be directly observable in the short term.

In the research, the interviewee were asked regarding the purchasing decision, the purchasing criteria regarding the environment and animal welfare. Both of the interviewees responded that the quality of the skin and prices are key selection criteria when they making purchasing decision. Both of the them were asked extra question about how they understand "sustainability", one answered 'the sustainability is about the planet, protect the environment for our grandchildren and great

grandchildren will inherit.’ ‘the sustainable is regarding minimizing the impact to the environment and reduce the pollution to the planet.’ Through the interviews and the observation, the Chinese fur manufacturers is seen has low commitment and awareness about the sustainability, and the economic performance is vital for the company, the lack of sustainable value and mindset is a barrier for industry to achieve sustainability.

One of the positive thing I observed , is that , 90 % of the Chinese fur manufacturer are family owned. For these kind of family business, the success of business often relies on its owners ability in a certain area beyond the absolute superiority. From my observation, the age of the successful fur manufacturer entrepreneur is generally concentrated in 40-50 years old. Most of them started the fur business after 2000, after 20 years growth and struggle, they achieve the success . Most children of these entrepreneurs are in the 20-30 years old .

Based on the observation, the fur second generation, most of them have participant the Copenhagen Fur - Qinghua university association fur course. In addition, most of them have studied or worked overseas and feel comfortable speaking English . Compared with their father generation , they will likely be more consider the status of the whole industry and future development of the fur sustainability.

5.6Transport

According to interview with the customers, from 2016, most customers can have the skins in flow packed and sealed before transport. the skins can not only protected in their airtight seal, which protects them from oxidation and keeps leather flexible , it also ensures protection against fur beetle. And as an added benefit, packing the skins in vacuum sealed plastic also reduces the space in each box , the space with new pack can reduce 17 % compare with the original transport way, that means that the customer receive the skins in smaller boxes which reduces the overall cost of air freight.

5.7 The recycle and up-cycle

Recycle is a useful way to give longer life time to the fur product and be sustainable to the environment. According to the interview, The recycle fur coat is not common in the Chinese market. In the biggest fur shopping center Tongerpu, there is only one service center can repair, maintain and recycle the fur coat.

6. The recommendations and suggestions

In the last chapter, the report highlight the sustainable supply chain problems in the fur industry , the aim of this chapter is the recommendations and suggestions to overcome the problems identified.

6.1 The Welfur programmer

The political climate and image risks associated with the fur trade have a significant impact on the future outlook of all stakeholders and form the basis for the very existence of the industry. The political climate in Finland and Denmark is still in favor of fur farming. From the tableNetherland and Poland, they are important mink production countries and suppliers in the fur industry. In Poland, the attitudes toward fur farming have grown more critical. in the Netherlands, an appeals court decided in November 2015 to uphold the mink breeding ban imposed by the Dutch Parliament. The Dutch fur producers' association will appeal the decision. If the ban eventually enters into force, it will happen in 2024. Therefore, The improvement in the wellbeing of fur animals will contribute to the long-term viability of the fur trade(Saga Furs, 2015).

In order to meet the rising demand from consumers and the fashion industry to document origin and animal welfare standards of the mink skins, The industry has funded research on animal welfare in order to improve conditions for fur farming. In addition, the Copenhagen Fur implements the `Welfur` programme. Welfur is a joint European trade initiative started by the European Fur Breeders Association (EFBA) in order to draw up a welfare protocol based on Welfare Quality - standards to assess the animal welfare on farms⁹.

According to Copenhagen Fur News (2017), the Welfur programme start Scandinavian mink farms in 2017, then applicative on farms in ten other European countries, until 2020, all 4000 European mink farms must be certified by Welfur. And the auction house Copenhagen Fur, Saga Furs and NAFA will only sell the Welfur certified mink skins. The auction buyers are sure the knowledge of the origin of the mink skins and under which conditions the animal were bred. Therefore, ,the Welfur programme is a effective tool for ensuring that the mink farm operate in a sustainable and responsible manner. The Welfur can see as a quality standards for the fur industry, such as the GOTS label for organically grown and processed cotton products in the textiles industries, the Oekotex-label for textiles free of harmful substances , the Woolmark-label and its sub-labels for

⁹ The internal magazin,Kopenhagen Fur news ,2017

wool products, the organic label for the food industry. Labeling fur products could be taken even further by making the production process transparent, thus the consumer would have the opportunity to select or deselect certain materials and processes (Skjold, 2016).

The animal welfare in China

The animal welfare standards in China have been in place way after Europe. According to the email from Kelly, In Europe, all of resources and effort have been put in scientific research and from time to time to improve the standard. In Asia, it is still at developing stage, the government tried to modify the standard to meet the international standards. The modified animal welfare standards for fur breeding animal will be released in June this year. This modified standard will mostly meet the international standard.

Through the interview, the Chinese mink farmers realized the importance of animal welfare for the fur industry, animal welfare is not only consumer concerns about it, farmers also hold the highest standard and regards on animal welfare. The Chinese fur industry realize that care and attention of the animals during breeding and production based on scientific research, the result will be not only provide benefit to the environment and sustainable use of the resource, but also result in better quality mink skins and gain good economic return for the farmers and overall benefits for the public as well.

But the biggest challenge for the Chinese fur farming will be for the government and associate industry associations to promote it national wide. China is a very big country, how to educate and monitor all the farmers to put the standards in place and follow it will be the biggest challenge. However, the government, industry associations, and industry people had expressed in the public media conference in 2016, the animal welfare is very important for them

6.2 Traceability, and transparency

Welfur and certification of farms is one link in traceability and transparency. The transparency and traceability of fur product have gained importance for all parties in the supply chain. A good tracing system give the fur trade which in terms make the fashion house and the designers feel safe about having fur in their collection and design. The consumer demand full transparency of the product they buy and consumer. Transparency therefore increase the importance in the fur industry. In Copenhagen Fur 's internal magasin " news", the CEO of Copenhagen Fur Jesper Uggerhøj, emphatically point out the importance of transparency and traceability in the fur industry.

According to Hicks (2012), The labeling can provide information to consumers about credence attributes, for example whether produce is organically produced or not, whether a product is child labor-free, etc. the labeling is a way to eco-labeling is seen as a way to tap consumer demand for how a product is produced by providing credible information about production practices and methods(Hicks ,2012). Welfur replaces perceptions about animals welfare with fact by documenting the welfare on fur animals and providing consumers with transparency about fur production. Certification of fur farms and the traceability are the main mechanisms of meeting the increasing challenges of sustainability and social responsibility.

6.3 Production development

In the previous section, the report defined that the dressing and dying of furs is seen as the one of most pollution industry, the dealing with chromium is still the most dangerous part in the dressing and dying process, which will harm environment and human health. According to Kozlowski etc (2015),the research of improving supply chain sustainability in the fashion industry is mainly focus on the development of cleaner production technologies. Today, even the best and carefully managed factories, it is still impossible to recycle all of the hazardous waste from the fur skin dealing process. In dealing with current problems and futures challenges, such as the increasing pressures regarding chemicals using , water waste and pollution, the supply chain manage are urged to ensure a change and development within this industry. Together with the pressure from consumers awareness, stakeholders´ expectation, new product development through finding new ways of using fur material and manufacturing techniques improvements at all levels and transferring it to the manufacturers ´s production processes is a major challenge to increase the sustainability in the supply chain.

For the fur farming, the industry need to develop the research on the animal welfare, animal disease and health, feed, environment conditions, product quality to breeding the healthiest animals in the most appropriate manner

6.4 Managing relationship with different stakeholders

6.4.1 The education sustainability for stakeholders

According to Kozlowski etc(2015), One of the key success factors to improve sustainability in the fur industry is increase the awareness and concern to the key stakeholders. One of the barriers from the findings is that the important stakeholders----- the fur manufactures who has critical position in the supply chain, only focus on the economic purpose but has low commitment and knowledge about the sustainability. As explained in the literature, one of the effective way to implement sustainability in to stakeholder is education. The supply chain manager has to increased to efforts in education for sustainability, the knowledge is a key to more sustainable business practices. The fur manufacturers have to recognize the equal importance of economic sustainability as well as social and environment sustainability , and the potential benefit that linked to them, as the economic performance and the social, environment dimension are not conflicting but interlinked.

For the end consumers, through the increased sustainability awareness, the consumer can learn how to make more sustainable choices when they purchasing fur garment, and the knowledge of the use, disposal , up cycling of the fur products. To achieve sustainability, the consumer is a focal point in the process, for example, the up-cycling fur garment require the consumers ´ engagement.

According to Skov (2005), the fur industry was at a loss at how to respond to the anti- fur campaigns and the animal right campaigns had a significant effect on the fur industry. one effect is the campaigns relocate of the manufacturing the industry from Europe and North America to East Asia. it occurred that many fur manufacturers in Europe and North America out of business, and in order to cut costs, they close down their local workshop to source fur garment to overseas .

Gereffi (1999)defined a global commodity chain framework, which emphasis the importance of the power of `lead firms `in a supply chain and views the coordination of the entire chain as a key source of competitive advantage that requires using networks as a strategic asset. According to Gereffi (1999), each supply chain can be identified by a governance structure : producer-driven" and "buyer-driven" global supply chain. the characteristic of producer-driven chains is that large, usually transnational firms play the central roles in coordinating production networks(both in the upstream and downstream), typically in terms of advanced capital and / or technology, the example include automobile industry, aircraft. By contrast, the characteristic of the buyer-driven chains is the scarce resource, and refer to intense competition among suppliers, such as the garment industry and other light consumer product(Gereffi,1999; Skov 2005)

According to Skov(2005), the fur industry can hardly to classify into either producer or buyer driven supply chain. If we were to use any one of the concepts, the global fur chain could be said to be producer-driven. compared with the family owned but with large numbers mink farms and fur manufacturers, the auction house shows the importance of operating close to consumer markets. According to Hansen (2016), the auction house Copenhagen Fur has forward integration in the retail link, fashion and design sector. And we mentioned in the previous chapter, China is the most important market for the fur industry. Copenhagen Fur has entered into a number of partnership with Chinese players in the fur sector, from manufacturers shopping centers and universities, this integration in the supply chain give the opportunity for Copenhagen fur to target to the fur manufactures, the designers, and the end consumers. The forward integration supply chain enables Copenhagen Fur to promote sustainable development all the way from primary production to the fabrication of the end product . (Skov 2005)

6.4.2 Open communication

The majority of the environmental impact from fur production occurs in connection with fur animal breeding. From fur farming to then end consumers in the market, the fur industry ´s long and complex supply chain sets special requirement for open communication. To ensure that stakeholders receive accurate, verifiable and reliable information on the industry´s development and the impact of its activities, the industry must have open and responsible communication. The open communications have a significant impact on the future of the entire industry.

With regard to the animal issue, the industry can respond with a strategy of dissemination and production knowledge. the Danish fur farming has adopted a policy of openness so that members of the public can visit fur farms and auction houses ´to see for themselves´(Skov 2005). The organization Europe Fur Association conducted to a independent market research company made a survey, it demonstrate that many different factors play a role when it comes the people s opinion about the fur farming, it independent of whether the information comes from the media or first hand, the study suggested that the more people are informed, the more they find fur farming are acceptable. According the research, there is a higher percentage of people who have visited a fur

farm that find fur farming acceptable compared to those who have not visited a farm. The survey shows that 95% of the European who find fur farming unacceptable have never visited a fur farm¹⁰.

6.4.3 Culture re-defining to the stakeholders

According to the stakeholders potential threaten to the organization and the stakeholders potential for cooperation with the organizations, Cuthbertson etc (2011) classify the organization supply chain stakeholders into four types to help supply chain managers to specify the sustainable supply chain strategy for managing supply chain stakeholders: Mixed blessing stakeholders with collaborate strategy, supportive stakeholder with involve strategy, non-supportive stakeholder with defend strategy, and marginal stakeholder with monitor strategy.

In this case, the anti fur NGOs obviously has significant impact and potential threats to the fur industry, but with low potential cooperation opportunity, therefore the Anti-fur NGOs can see as non-supportive stakeholders. Suthbrttson etc (2011) suggest that the non-supportive stakeholder may best be managed via a defensive strategy, one that aims to reduce dependence on the stakeholder concerned. The industry can re-defining to the culture of using fur through the fur history and storytelling.

Kopenhagen Fur and Design School Kolding have implemented partnership programmer to investigate the fur and sustainability with a design perspective from 2014 to 2016. In their 's research, they defined the relationship between personal memories and culture memories, memories of fur can be seen as sustainable, memories has a sustainable potential to the future. They narrated examples and stories about the Inuit culture and mink farms show that sustainability is connected to how people establish emotional relationships to fur and thus indirectly to other humans in the past and in the present(Skjold 2016). They defined that they industry need a radical change in people's mindset about fur, if the fur industry want to remove the negative memories and imaging of fur and operational fur as sustainable. Their suggestion include that tell new stories about the meaning of fur through personal memories of mink farmers and the company management. Furthermore, the proposal include that revitalize the connection between fur and nearly forgotten cultures such as the Inuit culture, and the way these cultures saw fur as deeply connected with nature, something that tied together the community and the family, to go beyond the old memories that fur is conspicuous consumption of the rich class(Skjold 2016).

¹⁰ <http://www.fureurope.eu/fur-information-center/facts-figures/differences-in-the-acceptance-of-fur-farming/>

6.5 Longer life cycle

The industry can improve the sustainability of fur product across its life cycle, increase the fur garment life times is a important mean of achieving a reduction on the environment impact. The fur is seen as a durable materials. According to the DSS (2012)report, a fur coat can be used at least 36 years, but the reality is to keep a fur garment for 36 years is very rarely take place. The reason is that, the first , fur coat is a fashion product, the identity, fashion and trend , those human need has impact on the life time of the fur coat(DSS,2012;Kozlowski,etc 2015) .

In this section , the suggestion include the design for menswear and recycling for fur garment to achieve sustainability in the industry.

6.5.1The menswear

The industry can integrate sustainability concept to the design process. Women and men have different decision making behavior and buying behavior. Skjold etc (2016) define that the from traditional view, normally the fur coat is associate with fashion and ideas of femininity, hence with seasonal change and rapid turnovers. In contrast, the menswear is seen as " non - fashion " and focus on the style, craftsmanship and tailoring rather than fashion and looks. therefore compare with the women, the men normally acquire and use garment at a much slower pace. currently the market share for fur menswear is 5% of the total fur sales¹¹, the industry can gain sustainability agenda to increase sales for this new segment.

6.5.2 Fur up-cycling

Fur up-cycling can give a new life for the old fur coat already outmoded and hanging in the closet, and is another effective way to extend the life time of the fur garment. recycled fur is a far more economically available and environment friendly material than new fur, Through up-cycl, the old coat can be given a more current , modern look. and create something completely new , for example, a fur collar, a handbag, a vest , etc. A positive example is the Canadian fur manufacturers Harricana Par Mariouche, by recycling old furs, the company saved the lives of more than 800,000 animals, and breath new life into more man 80,000 coats, which would never been worm again if they had

¹¹ www.fur.org/fica-facts

not been remodeled¹². Through give the gorgeous materials a second life and transform them into unique, the second fur can also be sustainable.

6.6 Supply chain integration and information sharing

Key findings mentioned in the last chapter are overproduction, inventory, transparency and traceability problem in the supply chain. These challenges can be overcome and reduced by the supply chain integration and information sharing.

The characteristics of the fur industry supply chain is that it composed of many parties involving agriculture, auction house, chemical dealing process, garment manufacturers, wholesaler, retailer, and the world wide location of the parties lead to one of the longest and most complicated supply chains.

Direct integrate with supply chain members can lead to a synchronized supply chain, where result in better forecasts and reduced demand variability, reduce total inventory levels, decrease product obsolescence, lower transaction costs, better capacity utilization, react more quickly to changes in the market, and respond more promptly to customer requests (Markley and Davis 2007). The demand forecasting is constrained by many uncertain factors, such as the weather, the fashion trend. Each member in the supply chain manage uncertainty in their stage by using a buffer of inventory (Chen 2016). Then inventory can be kept low if the uncertainty can be minimized by sharing of real-time market information and demand data.

Hugos (2011) introduced the CPFR process, where the supply chain partners collaborative planning, collaborative forecasting, collaborative replenishment. He defined the supply chain use technology to support a CPFR process are the most effective supply chain. But the challenges here is the huge number of the suppliers (the mink farmers) and the huge number of customer (the fur manufacturers), how to manage the product data standards in the process.

¹² http://www.harricana.qc.ca/our-brand?__store=default&__from_store=french

6.7 The economic performance with sustainable practice

Within sustainability, financial responsibility is viewed as being equally important as environmental and social responsibility. According to Carter and Rogers (2008), The sustainable practice should balance the economic, social, and environment dimension at the triple bottom line. In the fur industry, the firms engage in sustainable supply chain management practices attain higher economic performance than the firms which concentrate solely on the economic performance, the potential economic advantage include:

There is a significant economic benefit connected to Welfur in the mink farmers. In the auction sell, the quality of the skins decide the price. The damaged skins fetch a lower price at the auction. Poor feeding results in fewer kits and poor growth, therefore a low sales price .the good animal welfare result in a better quality with s higher price. If a farmer has a high score on the Welfur criteria, he will gain also more profit than the farmers with a lower Welfur score.

For the consumers in the Chinese market , the fur certification can support the Chinese consumers to identify the quality of fur products from various from various source. China as one of the largest fur consumer market in the world, has a great number of fur retailer enterprises in the leather malls, retailer stores. However, due to the diversity of the enterprises' scale and size, the fur garment product in the end consumer market has been damaged by vicious competition with the continuous change of raw materials, the consumers lack a guidance to identify the fur , through the certification of the mink garment, the consumer can guaranteed that the cost and the money they paid is worth to the value.

For the fur manufactures in the Chinese market, can also benefit from the implement the sustainability in the supply chain. the fur manufacturers who adapt to the demands of the new sustainable consumers can benefit from the new market opportunities and gain first mover advantages , and then fur manufacturers can differentiate them as sustainable fur garment suppliers to gain competitive advantage in the market which the other player differentiate with the price and quality at the traditional way.

Although the employee in the industry is not discussed in the report, the sustainability management also improve the company ´s health and safety standards, the employees obviously profit if the industry implement the sustainability practice.

7. Conclusion :

Currently the pelts can be only traced in the upstream of the supply chain until the auction house, the material process in the rest of the supply chain is still non-traced, the challenge is that the industry has to integrate and communicate with the supply chain partners, find a solution to ensure the sustainable in the whole supply chain. The industry sustainability is criticized the animal right and animal welfare, and the environment impacts from the fur farming and fur processing, the industry is required react as a whole to respond the issues of environment sustainability and animal welfare. The industry's critical player ---- the Chinese fur manufacturers has low awareness and low commitment about the fur and sustainability, where the need for more information, education and communication. The key barriers mentioned in the findings include also the overproduction in the supply chain, the overproduction lead to the waste from the discarded fixed asset, and other input to the mink farming. And as the raw skin has high temperature controlled requirement, to store the skins has high energy consumption.

The recommendation and suggestion is also given in the report: Integrate the whole supply chain from the mink farmers to the end consumers in the market, share the information between partners. Changes to achieve a sustainable supply chain include the sustainable product development, the new technology and process to reduce the environment impact in the supply chain. The open communication give the stakeholder a transparent view of the fur's life cycle.

The toward long lasting fur garment is also a sustainable choice, the longer life time of the fur garment can be achieved through the new market segment ----the slow pace menswear and the up-cycling of fur coat. The industry have to increase the sustainable awareness of the stakeholder , NGOs, farmers, the garment manufacturers , auction houses and end consumers should collaborate within the supply chain offers opportunities to co- create new technology, values that further sustainable production and possibilities.

Further research

When I do the literature research about sustainable supply chain, most article mentioned is seen that the supplier relationship management to achieve sustainability, the most is regarding the buyer in the developed and western countries, mainly in Europe and North America. And the suppliers in the developing countries with low labor cost. when that the buyer firms support or push or motivate the supplier to be sustainable and ethic . But now the role of China is convert from a manufacture location with cheap labor to a important consumption market for both B to B, or B to C. Alike in this case , the Chinese buyers and Danish suppliers, which the weak sustainability in the upstream but relative weak in the downstream in the supplier chain. The same situation is also in the milk and dairy industry, the pork industry, in these kind of supply chain, how to motivate sustainability in the supply chain partner in the Chinese market which can be a further research.

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Appendix

Interview questions to fur manufacturers

- 1.China also produce large amount of minks , why do you pay the transport cost, the auctions fee and other additional costs to buy the skins in Kopenhagen Fur auction ?
- 2.do you know about the Danish mink farm animal welfare programme ? what do you think about that ? would you like to pay more (0.1 EURO) per skin from animals with high animal welfare ?
3. do you also buy skins from the Chinese mink farms ? What do you think about the Chinese mink production ?
- 4.Do you apply any environmental and animal welfare criteria when making purchasing decisions?
which factors do you consider when you choose a supplier ?
- 5.What kinds of effort does your company make to reduce the use of environment harmful materials or the restricted substances and chemicals?
- 6.What programs do you have in place, or planned for promoting resource efficiency for example reduce waste and practice energy when possible ?
- 7.What Policies are in place to monitor and manage your supply chain regarding environmental issues ?Any third party certifications your factory has in regards to environmental issues ?
- 8.How do you think of the supply and demand of raw skins in the market ?
- 9.What type of sustainable packaging/shipping materials do you use?
- 10.What does your company do to minimize the environmental costs associated with shipping?
11. Have you implemented any recycling in your factory? have you thought about that ?
12. I know you are from Tongerbao ,a big fur shopping center in Northeast Asia, do you know how is the recycling or upcycling situation in the shopping center ?
- 13.How many employees in your factory ? Do they all have labor contract ? How is the condition of the employment, for example the maximum daily and weekly working hours, health, safety and well-being ?

14. Does your company have a written health & safety policy in place, which complies with industry, national and standards

15 any other activities your factory taken to integrate sustainability practices principles into your operations