

How can we create value in the Fashion Industry Supply Chain?

Proposal

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1. Context and Problem

The fashion industry is one of the worst polluting industries on the planet (Pal and Gander, 2018). According to a recent study in 2020 by McKinsey & Company, “...*the global fashion industry produced around 2.1 billion tonnes of GHG emissions in 2018, equalling 4% of the global total. This is equivalent to the combined annual GHG emissions of France, Germany and the United Kingdom. Around 70% of the fashion industry’s emissions came from upstream activities such as materials production, preparation and processing. The remaining 30% were associated with downstream retail operations, the use-phase and end-of-use activities*” [fashion-on-climate-full-report.pdf \(mckinsey.com\)](#) (Page 63-52). This study highlights that the fashion industry’s emissions come mostly from upstream activities, which take place at the beginning of an industry’s supply chain, such as the sourcing and production of materials.

In addition to questionable environmental practices, the fashion industry is criticized for poor social practices all along the supply chain. One of these criticized social practices is the way labour is treated. Workers along the global supply chain have been under increased pressure to work long hours, with low pay, and poor working conditions. And this pressure is

coming from the top of the supply chains: major brands that are pushing for shorter lead times in production (Ashwin, S., Kabeer, N., & Schüßler, E. , 2020).

The challenge for fashion brands is to manage their supply chain in a way that is ecologically, socially, and economically sustainable (Connell and Kozar, 2017). One way to help achieve this sustainability is to narrow the supply chain and create value at each level. A narrow supply chain would be a clothing manufacturer sourcing raw material locally, and be involved at each level, referred to as *farm-to-closet* (Burgess and White, 2019). The farm to closet supply chain helps the fashion brands develop personal relationships with suppliers, thus reducing the carbon footprint by valuing the local community (Burgess and White, 2019).

The challenge is to determine the value of a narrow, local farm-to-closet supply chain. Traditional financial measures might not suffice. As we mention above, supply chains should be valued based on measures beyond financial indicators to include social capital and the environment (this is known as the *triple bottom line* that we discuss in the following section, with references).

The importance of measuring value beyond financial measures is addressed by CPA Canada in their recent Foresight Initiative. In this Foresight Initiative, CPA Canada includes the measurement of value that goes beyond traditional financial measurements and stresses the importance of measuring performance from the perspective of stakeholders other than only shareholders ([02404-RG_Value Creation Primer Brochure_EN_Final \(3\).pdf](#)).

In the fashion industry, these other stakeholders would be local communities, employees, customers, and stakeholders concerned about the environment. The problem is finding a

concrete example of how the value of a supply chain in a specific sector of the fashion industry could be measured based on CPA Canada's Foresight Initiative.

2. Research Objective and Research Questions

To address the above-mentioned problem, the objective of this research project is to conduct a Case Study involving the actors of the fashion supply chain of one specific Canadian fabric: wool. Most of the clothing manufactured in Canada is made from wool imported from countries such as Australia or New Zealand. This is surprising, since Canada is an important wool producer. The problem is that Canada does not add value to wool, which is simply exported as a raw commodity to other countries that create additional value from the wool

[\(TCFW+Canada+-+Wool+Plan+2021-26+-+Full+Spreads+Version.pdf \(squarespace.com\)\)](#). Only 10% of Canada's wool production is consumed in Canada, the rest is exported.

One of the main reasons that value is not added to wool is that wool processing is complex ([Canada's Wool to Market \(premier-choix.ca\)](#)).

According to Matthew J. Rowe, the CEO of the Campaign for Wool in Canada, Canadians need

to better understand how to create value with Canadian products, such as wool. Regarding wool, Rowe says, “It’s a classic Canadian story: we supply a commodity, we sell it abroad, and then they add the value, and then they sell it back to us as finished goods,” he says. “We’re not going to build a sustainable economy that way” Eckersley (2020) (Page 1).

Therefore, our research objective is to interview and observe the main actors in the supply chain, starting with the supply of raw wool (farm) right to the client (closet) to document and measure the potential value of this wool supply chain. In our study, we will base our measurement on the recommended Foresight Initiative by CPA Canada – determine the value considering the perspectives other than shareholders. In other words, we will measure the value with economic, social, and environmental performance indicators. We want to create a case for the use of Canadian wool as a value-added material for Canadian made fashion items. We will not observe and measure actual wool production in Canada, since most of the wool is exported. Instead, we will interview (and document and observe) all the potential actors involved in the wool industry (including fashion producers that could use local wool) to build a case to show the overall value for fashion manufacturers to source their wool locally.

The following are the general research questions (A more detailed set of questions will be used during the interviews, once we validate an interview guide):

Sheep farmers and wool producers

1. *What is the overall process to produce wool (including inputs and outputs) ?*
2. *How much time does each activity take and at what cost?*
3. *How many people are involved ?*
4. *How are the people treated ?*
5. *How are the animals treated ?*
6. *How much waste is there ?*
7. *Where does the waste go ?*
8. *What other financial, social or environmental factors should we consider if you were to produce wool for the fashion industry ?*

Fashion stakeholders (including distributors, manufacturers, and retailers)

1. *How could you use locally sourced wool as a fiber?*
2. *What fibers that you presently import could be replaced by locally sourced wool ?*
3. *What overall value for your business and your client do you perceive by switching to locally sourced wool ?*
4. *How would using locally sourced wool affect your financial results ?*
5. *What impact would locally sourced wool have on social capital and the environment ?*
6. *What advantages and disadvantages do you perceive using locally sourced wool ?*

3. Relationship to Existing Research

In the following section, we present recent academic research that addresses the issues of sustainability regarding the supply chain in the fashion industry. We first present the literature in the fashion industry supply chain followed by the triple bottom line that is used to measure sustainability in the fashion industry. We end this section by justifying the need for additional research using a Case Study to determine empirical evidence on how to measure the sustainable value of a specific fashion industry supply chain.

The importance of the supply-chain in fashion sustainability

Globalization and the geographic transfer of labour and material sourcing has been blamed for negative environmental and social issues in fashion (the Rana Plaza disaster in 2013 is an example). Increased consumer demand has put tremendous pressure on material and labour resources that feed into the global supply chain (Khurana and Ricchetti, 2015). According to

these authors, fashion brands have expanded beyond their country of origin to source material and labour in other low-cost countries that have lower labour and environmental standards. Interestingly, Khurana and Ricchetti (2015) cite the research of Seuring and Gold (2013) and Ho and Choi (2012) who find that customers want material and economic value from fashion products and are not concerned about the different players along the supply chain.

One of the problems according to Khurana and Ricchetti (2015) is that social and environmental management must happen all along the supply chain and unfortunately in the fashion industry that supply chain can be very long. The authors cite the Rana Plaza disaster, and according to the Clean Cloths Campaign (2013) ([2013 Annual Report — Clean Clothes Campaign](#)) many brands involved in Rana Plaza did not know who was sewing and assembling their clothing. These authors stress the need to move beyond the first tier in the supply chain and get close to the producers of raw material (brands are normally far from the level of raw material).

One example of a brand getting close to raw materials to help assure sustainability is Gucci. In 2013, Gucci launched a leather bag that addressed the deforestation issue. Each bag had an ID with information about the source of the leather to assure customers that the leather was not sourced in countries where cattle production has been blamed for serious deforestation, such as Brazil (Khurana and Ricchetti, 2015)

This highlights the importance that all the different levels of the supply chain be involved in assuring sustainability, including the producers of raw material. To support this claim, Wang et al. (2019) stress that sustainability in the supply chain in the fashion industry depends on suppliers at all levels, including the suppliers of raw materials. Managing the suppliers at every level is necessary to assure cost effectiveness as well as environmental and labour friendly practices.

More information on sustainability is disclosed to investors by companies, along with traditional accounting information (Siddiqui et al. 2020). This has shifted the responsibility of sustainability from third party activist groups to the actors directly involved in the supply chain. In their article, Siddiqui et al. (2020) cite Burritt and Schaltegger (2010) who suggest that sustainability accounting should help managers all along the global supply chains to make decisions that could sacrifice economic benefits for the sake of social or environmental benefits. This sustainability accounting is referred to as triple bottom line (TBL).

The triple bottom line (TBL) used to measure sustainability in the fashion industry

The triple bottom line considers three different ways to measure performance, considered by some as the 3 Ps: profit, people, and the planet (Connell and Kozar, 2017; Friedrich, 2021).

More precisely, the triple bottom line measures performance with traditional measures of profit, but also includes social capital (people) and the environment (planet). The authors mention the importance of using the triple bottom line measurement by looking at the overall supply chain, from the production of raw material right to the disposal of the final textile product (Connell and Kozar, 2017).

The TBL might not be a way that clients will measure their perceived value in the fashion industry, leaving the onus on suppliers along the supply chain. Park and Kim (2016) surveyed 732 US consumers of both fast fashion brands and sustainable fashion brands to determine if the TPL could be an effective accounting framework to predict consumer loyalty to brands in fast

fashion and sustainable fashion. Interestingly, the results of the study showed the economic sustainability (right style, quality, and durability of material) was a greater predictor of brand loyalty for both fast fashion and sustainable fashion in comparison to social and environmental measures. These results suggest that the stakeholders most likely to promote sustainability in fashion, as measured by the TPL, would be suppliers along the supply chain, rather than consumers.

In this brief literature review, we highlight the need for additional research to better understand how the different actors along the supply chain in the fashion industry - from sourcing raw material to manufacturing and selling the final product - could help improve the overall value of fashion products. And the way to determine this value needs to move beyond traditional financial measures to include social and environmental costs, that may not always be measured quantitatively (otherwise known as the triple bottom line).

One way we believe we can add to the academic literature on sustainability in the fashion industry is to study the possibility of redirecting the supply of an imported material to see if there is value in sourcing the material locally. This could help improve Canadian sustainability. According to Campanaris et al.(2015), the Canadian apparel market suffers from imports from low-wage countries and apparel exports that have been declining. The authors suggest future research to develop strategies to encourage partnerships between apparel suppliers and fashion retailers to help improve the sustainability of the Canadian apparel market. In addition, according to Turker and Altuntas (2014), future research on the supply chain in fashion should include real life data of suppliers in the supply chain in an area of fashion.

4. Method

To achieve our research objective, we intend to use interviews, documents, and observations to conduct a Case Study and evaluate all the processes, resources, and costs to source and process local wool from Canadian farmers, wool associations and wool producers that could be directly used by Canadian fashion manufacturers. We will also include the processes that the fashion manufacturers would use if they would use Canadian sourced wool. We will even include the perspective of the retailer, to see how wool material could be communicated to the consumer. The idea is to include all the supply chain – from the raw material to the end user- if possible.

We chose only one Canadian fiber because we want to assure that we capture all the potential steps of production, ranging from the raw material to the manufacturer and retailer.

Wool production provides us with a context that will allow us to observe a complete Canadian supply chain. It is the supply chain that we are interested in more than the raw material. We believe the value we determine in the wool production supply chain could be knowledge transferable to other Canadian materials.

Our proposed method for this research project is a Case Study. A Case Study approach is appropriate since we will be looking to obtain different sources of information - interviews, observations, and documentation. Yin (2014) recommends Case Studies when there could be multiple sources of information.

We plan to meet 2-3 people at each level of the supply chain such as farmers (including wool associations), those involved in wool processing, manufacturers, and retailers. We expect to interview approximately 20 people in total. We will also rely on documentation and observations for additional information.

The following excerpt briefly describes the complexity of Canadian wool processing (see Appendix 1 for an additional explanation of wool processing). We plan to observe and document the different processes, as well as interview the different actors involved in the processing.

The complexity of wool processing is why the wool is graded before it is sold. Medium wool goes to the woollen system and becomes sweaters, knitting yarn and tweed fabrics. The finer wool enters the worsted system, undergoing an additional process called combing and drawing which removes short ends (nails) and further straightens the long, smooth fibres. This wool makes the finest of wool fabrics. Coarse wool is streamed into the carpet system ([Canada's Wool to Market \(premier-choix.ca\)](http://Canada's Wool to Market (premier-choix.ca))) (Page 1) (Another detailed description of wool processing is described in Appendix 1 by one of the co-authors)¹

¹ It is important to note that the researchers will pay special attention to any animal cruelty. This will be documented in our results.

At this point we do not have a complete list of all the different people we need to meet along the supply chain, but we intend to cover the complete supply chain, from the farmer to those involved in wool processing, to manufacturing the final product, and the retailer selling to the end user (client). We will also interview fashion manufacturers that could use Canadian wool as a fiber in their production. We are also interested in meeting fashion retailers, responsible for selling fashion items with wool directly to customers. Customers will not be part of our targeted sample. This is because in our literature review, some research has shown that customers value economic indicators more than social and environmental indicators. We do believe, however, that our research results could be used to educate consumers by helping them better understand where their clothing comes from, and what are the steps in the process, from farm to closet.

Our geographic target is Canada. We believe we should be able to obtain most of our information from the provinces of Quebec and Ontario. But our initial interviews and documentation will determine if we need to source information and talk to actors in other Canadian provinces.

The two co-authors of this project come from two different disciplines: one from fashion and the other from accounting. If this proposal is successful, we plan on using a portion of the awarded funds to hire two students: one from fashion and the other one from accounting, as we detail in our budget below. Including the perspective of researchers and students from both fashion and management accounting should provide a rich multidisciplinary perspective on ways to create value in one fashion industry supply chain.

We will first map out the potential complete supply chain of wool production (from raw material sourcing to manufacturing to the end user). We will document, through observation, documentation and interviews each step. We will then use the recommended approach for value creation from CPA Canada's Foresight Initiative to look for value beyond traditional financial

measures. To do so, we will apply the triple bottom line approach and for each step along the supply chain, we will document the financial cost and benefit, the social cost and benefit, and the environmental cost and benefit. This analysis will include both qualitative and quantitative data. This will provide us with a complete picture of the value along one complete Canadian fashion supply chain. Our results will be in a form of a Case Study that will include interview excerpts, mapping of activities and processes, time calculations, and financial calculations (as well as other pertinent documentation we will collect). We will attempt to provide a final picture of the overall value creation of the wool production supply chain separated into three sections: economic value, social value, and environmental value.

5. Contribution:

The final output of this research project will be a Case Study that will include interview data, documentation, and observations that cover the complete supply chain of wool production in Canada. This complete supply chain will include data from those responsible for producing the raw material and include all the different steps that need to be taken to process the raw material (wool) for it to become a value-added item that could then be used by Canadian fashion manufacturers and enjoyed by Canadian consumers. This study will provide an example of how Canadian sourced material can be enhanced to increase its value so it can be used locally and not exported as a simple commodity. Wool and fashion are only the contexts for our study. The results of our study should provide transferable knowledge for other raw materials in various Canadian industries. The results of our study should help provide an empirical example for the

fashion industry, where value creation involves financial value for shareholders, but also social and environmental value.

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Appendix 1 - Wool Processing ⁱ

Farming and animals

Wool comes from sheep. Mohair comes from angora goats. Angora comes from angora rabbits; whereas cashmere comes from another type of goat and alpaca comes from alpaca. According to Robson, & Ekarius, (2011), there are many distinctive types of sheep wool - more than 100 types. Most known are probably Merino, Shetland, or Icelandic. Canada also has specific sheep such as the Canadian Arcott, the Outaouais Arcott and the Rideau Arcott, "... they are all raised primarily for meat production. Wool is definitely an afterthought in these breeds, but that certainly doesn't mean it can't or shouldn't be used" p. 316 (Robson, & Ekarius, 2011 p. 316)

Sheep, angora goats and alpaca were and still are today sheered either with scissors or with clippers; whereas angora rabbits and cashmere goats are manually combed. Sheep shearing takes place once a year in spring, before lambing season with the arrival of warmer weather. Shearing usually takes place twice a year in spring and early fall, angora goats. Angora goat's hair grows much faster, but the machinery for transforming it does not permit longer fibers.

Shearing into yarn

Once shorn, it is common to spread out the fleece for sorting the locks since fiber from the back of the animal which was untouched does not have the same feel as the fiber from the back or between the legs to put the softest ones together. Also, since sheep have a greasy texture, to waterproof and protect them, it is essential to wash and clean the lanolin, as it is often called. Then using water to ensure to not take out the grease but also to discard all other stuff that can be caught such as manure and herbs. Nowadays bundles are soaked into a giant bath where wastewater is discarded.

Prior to the industrial revolution, and still sometimes today, fleece is carded manually by hand, using a pin brush to untangle the fibers. Then when the fleece starts to look like a soft cloudy fiber or a cotton ball, using two brushes, it is combed and pushed backward on one of the brushes, creating a delicate cylinder of wool forming a smooth and hairy sliver. Then, using a spindel (spinning hand tool), we stretch these slivers hairy cylinder into yarn. They are wrapped around each other and twisted to make a non-breaking thread / yarn. Today, it is mostly done with machinery.

Dying or not

Wool (mohair, angora, cashmere, and alpaca) comes in many natural colors. Most of them have a good capacity of absorbing dyes and most of these natural fibers retain color. In days gone by, women used berries and flowers to dye. Today, dying is mostly done using chemical dyes. One must understand that when using natural dying, the luster was not always good. Natural dyes on such types of fibers do not provide very vibrant colors as if it was silk, or artificial dyes. The uniqueness or the irregularity of natural dyes are valued for its exclusivity of natural colors, but others find it challenging since it is almost impossible to replicate the same color over again.

Sheep, mohair, angora, cashmere, and alpaca yarns can be set up on a loom (manually operated or not) into a piece of woven or it can be knitted. Here is a brief description of the hand knitting process:

Knitting

“Knitting is the process of making a fabric or garment by interlinking one or more yarns in a series of connected loops. The loop of yarn that is manipulated during the knitting is referred to as a stitch. The two basic types are the knit stitch and the purl stitch.” (Keiser & Garner, 2017, p. 177).

Hand knitting works using two straight needles, knitting a flat fabric, or with double pointed needles (even today circular needles) knitting circular items. These are different from crochet, which uses only one “needle”. To start with, either flat or circular knitting, stitches are casted and set up on the first needle. With the interlinking process, back and forth from one needle to the other, stitches form rows, rapidly creating piece of cloth. Because of the elasticity (contrary to woven) and because most knits are designed and shaped to the body size - therefore not being cut prior to being sewn - it uses only the right amount of raw material - yarn, minimizing all waste.

Prior to the industrial revolution and knitting machines, women would knit socks, hats, mittens, scarfs, and sweaters according to their needs, their knowledge and their culture. One may think of the Norwegian sweater or the Peru hats. Since women were also familiar with the way stitches were interlinked, they repaired holes when they appeared, or some literally unknitted the garment to knit another project. Examples of today's famous Fair Isle knitting styles or Bernie Sander's mittens are good examples of how knitted yarn can be reused.

Since the industrial revolution, engineers and entrepreneurs patented new ways of producing, with less work force and more rapidity, targeting a broader market. Nowadays, knitting machines (strait or circular) allow the perfect knitting technics that produce not only tuques, socks and sweaters but also fine knit for swimwear, active wear, even lingerie. But arrival of mills required large quantities of wool under the same roof. Contrary to wine, wool comes from different farms. The arrival of mills and manufacturers also required redefining the environment (artificial damn, etc.) In addition, new regulations such as the illegalisation to wash wool in Canada, therefore our wools are sent out of the country to be washed, then back to some spinnery, blend, and sold as generic wool yarn all over the world, while the finest wools are imported from New Zealand.

i The source of this following wool processing is directly from the expertise of one of the authors of this proposal, who has extensive experience in the fashion industry. The main references that this author used to gain this knowledge are the following: Parkes, C. (2009; 2007) and Robson and Ekarius (2011)