

EXPLORING THE INTERWOVEN RELATIONSHIP OF ECO-FASHION:
A PRODUCTION AND CONSUMPTION ASSESSMENT OF THE ORGANIC
COTTON GARMENT

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Abstract

This paper utilizes an interdisciplinary approach in order to identify, analyze and review relationships and trends in consumer behavior and production processes that occur within the organic cotton garment industry. Past, present and future trends are analyzed through an economic statistical model in order to compare protection costs, market structures, and market outlooks for conventional and organic cotton industries. Consumer demand within the organic cotton garment industry is what guides eco-fashion purchasing decisions, and the factors that drive these decisions are extrapolated in order to quantify the information to identify trends and patterns. Additional data is obtained through a consumer behavioral study consisting of 94 participants that reside in the greater Seattle metropolitan area, provide a closer assessment of consumer behavior. The data indicates that consumers are willing to pay the industry standard and more for organic cotton garment and environmental attributes has significant positive correlations with both store related attributes and garment related attributes.

Keywords: organic cotton, organic cotton garment, eco-fashion

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Chapter One

1.1 Introduction

Organically produced cotton garments are an emerging and expanding niche product within the global cotton market. This research addresses questions about consumer demand for organic cotton garments through an interdisciplinary approach in order to more carefully predict the future trends of the industry. Previous research assessing the organic cotton garment industry has utilized a unilateral approach by isolating and analyzing the individual economical and psychological factors affecting the market. This research synthesizes previous research and introduces new data through economic and consumer behavior disciplines. Results from the compiled information predict the strength of the organic cotton garments future. The information obtained, combined with an advocacy and participatory research, may provide insights needed to promote change within the industry.

The interwoven relationship of this industry has many points of discussion adaptable to two or more areas of the research. Therefore, attempting for the most logical approach begins with addressing the background of the organic cotton garment. From there, additional information and research will discuss the beginning of the garment supply chain by examining organic cotton production, while simultaneously comparing organic cotton farming to conventional cotton farming. Then production costs of farming cotton will be explored. This economic information and more quantifiable and business related topic will transcend the discussion into the economic section of the literature, concluded with the topic that occupies the end of the supply chain, consumption. Consumer behavior drives the demand, so corresponding with the direction of the supply chain the research guides the discussion from production to consumption.

1.2 Production and Consumption

Production and consumption drive the business world, and these two bookends of the supply chain possess the means for the expansion of the organic cotton garment industry. “Links between producers and consumers have been a characteristic of organic agriculture. They are a necessary part of the structure if consumers are to be confident about the nature of their purchase. In this type of system the consumer is encouraged to consider not just the quality of the garments, but also the impact of his or her purchasing decisions over the lives of farming families and environmental conditions in the production area” (Myers & Stolton, 1999). This market relationship is a multi-disciplined area of study that contains many components that are interchanging between the topics discussed.

1.21 Conventional Cotton Production

Conventional cotton production suppresses developing national economies, pollutes the environment, and encourages discriminatory labor practices. Research on the organic cotton market indicates potential for economic, social, and environmental improvements. A transition to the more sustainable cotton farming production method needs to be encouraged for all the positive outcomes it offers. Through researching the key drivers of the organic cotton garment industry, the findings can be applied to increase consumption and therefore escalate the use of organic cotton. Organic cotton garments account for a large portion of organic cotton market sales and the consumption of these garments has a direct relationship with production. Identifying the elements that effect eco-fashion consumer behavior will supply information to build and encourage the organic cotton garment industry.

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Currently, cotton farming occupies approximately 2.5% of the world's arable land to produce twenty-five million tons of cotton annually (International Year of Natural Fires, 2009; Page & Ritchie, 2009; World Wildlife Fund, Cotton: a water wasting crop, 2014). The natural resources, including soil and water, are dependent on chemical supplementations in order to sustain cotton crops grown through conventional cotton farming techniques. Conventional cotton farming, overtime, contaminates the water table, degrades the quality of the soil, and compromises the biodiversity of the ecosystem (Myers & Stolton, 1999). Conventional cotton production in this research refers to all cotton production that is anything other than organic cotton farming. Conventional cotton production capitalizes on the increased revenue earned from reduced wages and relaxed environmental regulations common in developing countries, perpetuating labor practices, which promote gender inequality (Better Cotton Initiative, 2012). Every cotton-producing region within a country contributes to the combined negative impact that the earth sustains, increasing the rate of atmospheric degradation and contributing to climate change.

1.22 Organic Cotton Production

Organic cotton production methods that are commonly practiced have a substantial positive impact affecting the surrounding natural and socio-economical environments throughout the region. Sustainable farming is “an overall system of farm management and food production that combines the best environmental practices, a high level of biodiversity, the preservation of natural resources, the application of high animal welfare standards and a production method in line with the preference of certain

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consumers for products produced using natural substances and processes” (Council Regulation (EC), 2007; Meyers & Stolton, 1999).

Organic cotton makes up a mere fraction of the cotton market, and efforts to transform the farming production to the more organic method have proved to be slow and challenging. In the 1980’s organic cotton was introduced into the cotton market in efforts to reduce the negative impact associated with conventional production methods (Myers & Stolton, 1999). Cotton farming has consistently provided the fiber for the favored fabric that supplies a majority of the textile industry, and over 99% of that cotton is still produced through the unsustainable conventional methods (Illge & Preuss, 2011; Sathe, 2010; Yan, Hyllegard, & Blaesi, 2012). With cotton production occurring in poor developing countries, no public funding is available or even discussed for the environmental and social impacts resulting from conventional production methods (Page & Ritchie, 2009).

1.23 Organic Cotton Garment

The garment and textile industry supports over half of the organic cotton market. Expanding the market of organic cotton products could significantly influence growth of organic cotton production. “The retail of organic cotton textiles and clothing is increasingly conforming to regular textile and clothing sales. The involvement of the large brands and retailers, the number of points of sale is expanding rapidly, thus literally bringing organic cotton items to consumers” (International Trade Center).

Garment production and consumption is an input intensive industry. Morgan and Birtwistle (2009) emphasize the correlation between the increase in fashion consumption to the increase societies disposal rate, and the authors stress the need to curb this careless

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behavior. During garment production alone, 15% of fabric intended for garments is lost during construction (Rissanen, 2005). Garment production requires high amounts of energy and water for growing, manufacturing, transportation, and throughout the lifetime of the garment (National Geographic, 2013; Winkle, 1978). A single conventional cotton t-shirt uses 2,700 liters of water alone to produce, making it one of the most input intensive industries (Myers & Stolton, 1999; National Geographic, 2013).

The alternative organic cotton garment has less of an impact on the environment than all other clothing alternatives and considered to be an organic garment or eco-fashion (Laub, 2005; Mirza, 2004). Organic garments are considered, “garments made with natural materials that are produced using and components that have a low impact on the environment, offering doubtless benefits not only to the environment but to the producer’s health and well-being” (Moral Fiber, a beginner’s guide to the UK market, 2005).

After years of insignificant use in the fashion industry, organic cotton garments became more accessible in the 1990’s. Organic cotton garments became a major part of the eco-fashion movement. Eco-fashion is, “produced by taking account of its environmental impacts, which may be made with biodegradable or recycle materials and environmentally responsible production processes” (Chan & Wong, 2012). The definition takes in account the impacts to the environment throughout the production process, but there is no official industry standard that defines this term (Eco-friendly Fashion, 2006;). The term “Eco-fashion” is found throughout the literature to describe clothing, that is designed for longevity, produced ethically, and made with less harm to the environment

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(Fletcher, 2008; Joergens, 2006). Organic cotton garments are great example of eco-fashion and one of the most commonly found sustainable fashion products.

1.24 Consumer Behavior

Consumer's purchases of eco-fashion are the demand that fuels the supply of organic cotton garments. "Consumption is the reason why anything gets produced" (Heiskanen & Pantzar, 1997). Eco-fashion makes up approximately 1% of the fashion industry, leaving a large opportunity for growth (Lipson, 2008). Understanding the decision-making influences the effect consumer behavior is a key element that can be used to propel the organic cotton industry. Insight in consumer behavior will help the organic cotton garment industry understand the competition it has with conventional cotton garments. This research of consumer behavior will offer key information to influence supply and demand to encourage a positive redistribution of market share.

To better the health of people, the environment, and encourage social change the fashion industry needs to incorporate and expand their organic cotton buying for the sake of the environment and their own survival. Education and continual research of consumer behavior and the organic cotton production process will give the recipe to increase the expansion of the organic cotton garment industry and shift the market to the organic alternative.

1.3 Overview of Research

Original data was gathered from a sample population of the Seattle consumer with a questionnaire designed to find influencing decision-making factors. This survey was modeled after the questionnaire written in, "The Consumption Side of Sustainable Fashion Supply Chain: Understanding Fashion Consumer Eco-Fashion Consumption

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Decision” (Chan & Wong, 2012). The survey is designed to focus on factors involving store characteristics, garment related attributes, and consumers’ concern for the environmental degradation caused by garment construction.

Combined research and analysis show positive future growth in the organic cotton garment production and consumption. Economic analysis identifies long-term profitability in organic cotton production, and that farming production is comparable or more so than conventional cotton. The organic cotton garment industry is also showing positive outlooks as large retailers have continual plans to incorporate and increase organic cotton into garments. Price increases for eco-fashion proves to be a hindrance, but environmental concern can prove more important to the educated and environmental concerned audience. With marketing clarity, education, and ethical appreciation for the environment, the organic cotton garment industry will continue on its path of market expansion. Research demonstrates that consumer influences have begun to show positive patterns within the identified significant influencing factors.

Chapter Two

Literature Review

2.1 Introduction

The following is a compilation review of studies that, together, bring insight into the future potential trends of the organic cotton garment industry. Retail cotton products are responsible for the purchase of over half of all cotton produced, researching the supply and demand of the market will offer the best forecast. Interdisciplinary literature in both economical and sociological disciplines will provide a broad insight into the industry. These variables, when observed concurrently over a broad scope, best forecast the potential trends of the organic cotton garment market.

Initial studies discussed focus on the differences between conventional and organic cotton farming production methods, with a focus primarily on the different processes at the growing stage, and the appropriate minimal mention of the differences that occur throughout the supply chain. A compilation of economic data is used to compare past market trends and crop comparisons. Consumer behavior psychology research investigates consumer purchase decision-making in efforts to identify the variables that have more significance than the environmentally responsible product options, predominantly a focus on eco-fashion.

2.2 Organic Cotton Garment

The following research exploring consumer behavior looks at studies regarding eco-fashion and organic cotton garments, since organic cotton garments fall within the definition of eco-fashion. There are very few studies looking at organic cotton garments

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specifically, so to encompass more information and data a broader scope of eco-fashion was utilized.

Over half of all products in the textile industry are made out of the biodegradable cotton fiber (Subramanian et al., 2011). Cotton continues to be highly desirable with worldwide demand (Textile Exchange, Cotton Briefing, 2011; Myers & Stolton, 1999; Claudio, 2010; PAN Germany, 2007; Sathe & Crooke, 2010). It is estimated that 40% of the textile production that directly impacts the environment derives from cotton production (Textile Exchange, 2010 Global Market Report 2011).

Organically produced cotton garments are categorized under the term eco-fashion, which describes clothing that is designed for longevity, produced ethically, and with an emphasis on reduced environmental impacts (Fletcher, 2008; Joergens, 2006). Eco-fashion products emphasize the importance of avoiding negative environmental impacts, but unlike the organic cotton standards, there are no specific standards or guidelines for a product to be considered as eco-fashion (Eco-friendly Fashion, 2006; Joergens, 2006).

The best description and history of organic cotton garments was provided by the International Trade Center. Specifically, the literature covers the history and description of the organic cotton garment from the originating years to the present. From production to the retail establishment the article describes where these clothes are produced and how they are priced.

2.3 Cotton Farming Production

Understanding the production side of organic cotton explains the foundation that the organic cotton garment is built on. Significant literature is used to cover the farming process and how the two types of cotton compare. Economic information explains the

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structure of the market, the history, and helps to project the future output of production.

Together the background of production and economic tools thoroughly review the supply side of the organic cotton garment industry.

2.31 Overview of Cotton Farming

Finished conventional and organic cotton garments are indistinguishable to the human senses; the differences are at the farming level. From the type of cottonseeds used, farming logistics, and varying inputs, these farming methods have very different impacts on the environment and the social aspect involved with the production. There are different cotton farming methods other than organic and conventional cotton, but for this research these two methods are compared because they represent the opposite sides of the spectrum. Conventional cotton, for this paper, refers to any cotton farming method that is not certifiably organic.

2.311 Conventional Cotton

Conventional methods of cotton production are harmful to the environment and the farming communities that are supported by the crop. “The process of growing conventional cotton involves the heavy use of chemicals that poison the soil, air and ground water” (Patagonia, 2006). Conventional methods of farming involve the use of pesticides, as well as flood irrigation techniques, that waste and pollute local water supplies, and degrade the vitality of the soil.

Conventional farming methods often rely on genetically modified crops (except for Turkey, which prohibits GMO crops) and nitrogen based chemical fertilizers that are harmful to the environment (Textile Exchange, Turkey, 2013). Emissions from nitrogen-based fertilizers are over 300 times more potent than Carbon Dioxide emissions, and are

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one of the largest contributors to global climate change (Textile Exchange, A Year in Review, 2013, Cotton Briefing, 2011; Kramer et al., 2006).

The World Wildlife Fund (WWF), one of the largest environmental organizations of the world, produced several papers and information on their website that focus on the intensive cotton crop that is destructive to social and natural environments. They focus on the large amounts water needed to grow cotton and the effects it has on the surrounding environment. Pesticides Action Network (PAN) offered information on the different types of chemicals used for conventional cotton farming. The articles published by this international organization report the immediate and long-term negative health effects to people and the environment that are caused by conventional cotton farming. With both of these environmental organizations the farming conventional cotton farming process was explained through a very blunt and negative description.

The long-term impacts from conventional cotton farming are detrimental to the fragile ecosystems and developing economies of the farming communities. Long-term overuse of limited natural resources; pollution of the remaining resources, and lack of transparency within the supply chain creates a tumultuous and unsustainable future for the conventional cotton industry and life on Earth.

2.312 Organic Cotton

Organic farming methods are more sustainable and protecting the natural environmental conditional as well as the farming communities. Organic cotton is grown with non-genetically modified (GM) seeds and are “grown without synthetic pesticides, synthetic fertilizers, or chemical additives” (Myers & Stolton, 1999; Organic Exchange, 2007). Organic farming methods reduce nitrogen and carbon emissions by 40-72 %

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through the use of organic fertilizers and eliminating the introduction of synthetic chemicals into the environment (TextileExchange.org, 2014).

Sustainable farming not only has natural inputs, but also has a different method of continual care. Crops are rotated during the off-season providing the farmer with additional income sources, and naturally fertilizing the soil from the new crops that replenish the soil by adding back the nutrients that the cotton crop depleted. Cottonseeds are carefully chosen to provide the maximum yield for the farm, based on the regional climate conditions. Organic farmers also have access to a variety of education resources, partnering organizations, and agencies willing to assist farmers transitioning from conventional to organic methods.

Organic Cotton: From Fields to Final Product, written by Dorothy Myers and Sue Stolton (1999), provides a multitude of organic cotton terms, information about the organic certification process, and a detailed description of the organic cotton supply chain. The book provides an excellent explanation of the organic cotton production process and how it differs from the conventional farming method.

Sam Page and Barbara Ritchie's report, "A Report on Better Management Practices in Cotton Production in Brazil, India, Pakistan, Benin, Burkina Faso Cameroon, Mali, Senegal, & Togo", undertaken for the Better Cotton Initiative, compares the farming production process of conventional to organic and within several countries. The authors combined lots of research, most conducted within the areas of studied, funded by the regions government. The disadvantages and advantages between the two cotton types are clearly organized in tables and the inputs used were listed. Page and Ritchie (2009) describe the geographical characteristics of the growing regions, breaking down soil

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fertility, amount of precipitation, and the geographical coordinates of the region studied. Detail describing the cotton types grown and the quality the region produces are explained as well. Overall, this report was one of the most detailed comparisons throughout all the literature.

Organic cotton farming is different from conventional from the beginning to the end of the farming process. Seed types, inputs, the most ideal geographical location, and the knowledge based farming approach are some of the factors important to organic cotton production. Certification is only granted to organic cotton produced per requirements throughout every step. Conventional and organic farming processes are different from beginning to end, but still produce the same quality fiber and yield.

2.32 Environmental Impacts

Cotton farming uses many resources to produce, regardless of the production method chosen. Cotton needs land and lots water to produce the fiber used for clothes. Conventional cotton production methods are not sustainable and are more harmful to the environment. Organic cotton has minimal impacts and does not create the contamination and pollution that conventional production does.

2.321 Conventional Cotton

Conventional farming methods deplete the limited resources available within farming communities at an unsustainable rate. The studies reviewed in this paper indicate that conventional farming methods are detrimental to the environment. These methods use chemical fertilizers and flood irrigation techniques that pollute the surrounding environment, reduce biodiversity and the quality of the soil (Myers & Stolton, 1999; Pan Germany, 2007; Sathe & Crooke, 2010).

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Organizations including the Textile Exchange and Better Cotton Initiative have spent years studying the effects of conventional cotton farming. The data collected through their research shows that conventional farming leads to “reduced soil fertility, salinization, a loss of biodiversity, water pollution, adverse changes in water balance, and pesticide-related problems including resistance” (Myers & Stolton, 1999; Robinson, 2013). The unsustainable conventional farming method is the reason behind these organizations efforts to provide data to educate farmers on the best farming methods and ways to transition a cotton crop into a more holistic farming method.

Studies have provided supporting evidence, through quantitative data analysis, that conventional methods produce an excessive amount of Green House Gas (GHG) emissions, as oppose to organic cotton farming uses less energy, water, and emits less CO₂ (Subramamian Senthilkannan Muthu, Li, Hu, & Mok, 2011). The Inter-governmental Panel on Climate Change (IPCC) reported that 10-12% of global GHG emissions are produced from the agricultural sector. Current data forecasts an increase in these emissions unless the farming methods are drastically altered (Truscott, Denes, Nagarjan, Tovignan, Lizarraga, & Santos, 2013). Conventional cotton farming releases 4,017 Kilograms (kg) of Carbon Dioxide Equivalent (CO₂ Eq.) per hectare (ha) of cotton lint into atmosphere, which is significantly more than the organic alternative that releases 150 kg CO₂ Eq./ha (Soth et al., 2009).

Comparing the difference between the cotton farming production process shows that conventional cotton adds to climate change and has drastic environmental degradation qualities; specific categorical examples are given in Table 1. The differences in cotton when quantified show that conventional cotton is more damaging to the

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environment, has higher emissions, and consumes more energy and resources (Subramanian Senthilkannan Muthu, Li, Hu, & Mok, 2001). An increase in organic cotton garments will lead to an increase in organic cotton farming production and transition the fashion industry to be more sustainable and reverse the negative environmental impacts that conventional farming has caused.

	Organic Cotton	Conventional Cotton
Damage to Human Health	0.4	0.5
(Disability-Adjusted Life Years) (scale: 1000:1)		
Damage to Ecosystem Quality	2.9	3.2
(Potentially Disappearing Fraction of Plant Species)		
Damage to Resources	8.5	9.4
(Additional Energy Requirement to Compensate Lower Future Ore Grade)		
CO₂ Emission	2.5	6
Energy use in Mega Joules per Kilogram of Fiber	54	60

Table 1. Quantification of environmental impact for textile fibers. Source: Subramanian Senthilkannan Muthu, Li, Hu, & Mok, 2001.

2.322 Organic Cotton

Researchers have been reporting positive findings on soil vitality, increased regional biodiversity, and maintained quantity of water supply, which shows that organic cotton has less contributing effects to climate change. Through sustainable farming methods the risk of insect and disease is reduced and long-term prevention of pests is achieved through biodiversity and maintaining a healthier ecosystem. The health and condition of organic soil also prevents long-term soil erosion (Reganold, J. P., Elliott, L. F., & Unger, Y. L., 1987; Textile Exchange, Cotton Briefing, 2011).

The energy and environmental impacts organic cotton farming has been quantified and found to be significantly less than conventional organic cotton. Organic cotton produces 60% less greenhouse gas emissions than conventional cotton and reduces

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energy consumption by 25-50% (Textile Exchange, Cotton briefing, 2011; Textile Exchange, Snap Shot 2014). Organic farming methods reduce carbon emissions by 40-72% by using organic fertilizers instead of the synthetic chemicals used with conventional methods (Textile Exchange, Snap Shot 2014). Organic farms use natural fertilizers that recycle the nitrogen in the soil reducing the nitrogen rich gas emissions into the atmosphere, which are three hundred times more potent than carbon dioxide emissions (Kramer, Regnaold, Glover, Bohannan, & Mooney, 2006; Textile Exchange, Cotton Briefing, 2011).

Page and Ritchie (2009) produced a report on cotton management practices in nine countries on behalf of BCI. Their findings reported the conventional cotton farming impacts that contribute to climate change. The report categorized the different farming methods and their impacts on the quality of soil, water use, and the overall impact on the surrounding environment. The expanded documentation of countries and the clearly identified effects within the type of farming production made this research very valuable.

It is important to understand the market structure and production methods used in organic cotton production. Organic cotton farming provides a long-term, profitable, sustainable, and environmentally friendly alternative to conventional cotton production. To initiate a transition from conventional to organic farming practices, consumers need to be made aware of the negative effects that are occurring throughout the production of their garments. Companies also need to embrace changes that will secure long-term sustainable growth rather than short-term adjustments to maximize profits.

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2.33 Social Implications of Cotton Farming

The nature of conventional cotton farming produces negative social implications unlike organic cotton production, most significant of the social implications has been minimal investments in fair treatment of workers in conventional cotton production. There are approximately twenty million farmers and farmhands that make up the cotton producers of the world, 220,000 of those were growing organic (Organic Trade Association, 2014; Textile Exchange, Cotton Briefing, 2011).

2.331 Conventional Cotton

Conventional cotton farming has continually fostering low wages, child labor, gender discrimination, and hazardous working environments (Page & Ritchie, 2009). The market structure associated with the conventional farming process attracts populations with low incomes in developing nations, and creates a high risk situation where the farmer is always at risk of losing his/her livelihood with the occurrence of a single bad harvest (Warrick, 2013; Myers & Stolton, 1999).

Women face gender discrimination and disadvantages within conventional cotton farming production. They are discriminated through variances in wages, limited ownership rights, and the lack of access to financing (Myers & Stolton, 1999; Sam & Ritchie, 2009). The chemicals that are used in the harvesting and production of conventional cotton crops have been linked to complications in pregnancy, which is a reason that women are excluded from consideration for job positions with a risk of exposure to these hazardous chemicals.

Ergon Associates Limited was a valuable source of information and resources providing key insights on the social challenges that may develop during the production of

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cotton. The company published a report based on the audit that was conducted by them on the implementation of the Better Cotton Initiative's Better Cotton Fast Track Program. The material provides an in depth analysis on the safety and health hazards that conventional cotton farmers are faced with, as well as the positive changes that are possible for these farmers if they decided to transition to organic production methods. Studies have highlighted industry issues relating to health, safety, wage disparities, child labor, forced labor, and gender discrimination practices. A recent study conducted by Usher et al. provides an in depth objective review of problems, progress, and improvements of a company transitioning to organic production methods (Usher, Newitt, & Merouchi, 2013).

Ground water contamination, inhalation of toxic chemicals, and pollution of the environment affecting local food sources, decreases the overall level of health of the community exposed to these conditions. The community health issues and added financial burden from the instability of the market structure with conventional production methods outline the reasons why conventional cotton farming is not a sustainable, safe, or responsible system.

2.332 Organic Cotton

The organic cotton industry provides continuous support to farming communities by developing long-term partnerships with farmers, increased access to education, financing, and other resources in order to improve the standards and efficiency of the farm (Textile Exchange, A Year in Review, 2013). Non-governmental organizations (NGO's) and organic cotton initiatives partner with organic cotton farmers and contribute positive numbers that reflect their progress in education, improved labor conditions, and

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reduction in resource usage. Literature on organic cotton production indicates an improvement in labor standards and benefits for organic cotton farmers.

Organizations such as the Better Cotton Initiative and Textile Exchange aim to strengthen the organic cotton market in an effort to improve the socio-economic opportunities that are available to the developing cotton farming communities (Better Cotton Initiative, Overview of the Better Cotton, 2009; Myers & Stolton, 1999; Robinson, 2013; Textileexchange.org, 2014). These organizations conduct case studies with the goal of improving the market, and share the knowledge gained from these studies with the communities in an effort to create a sustainable and beneficial partnership (Page & Ritchie, 2009). Farmers are provided with information and assistance to maximize their success and crop yields. Additionally they are shown how to rotate crops during the off-season, providing additional revenue, jobs, and available resources for the local community.

Organizations affiliated with organic farming and fair trade standards provide financial assistance, education, and continuing research data to farmers while following international fair trade labor laws. The Textile Exchange and BCI provide oversight to make sure that participating farmers, and companies, comply with the organic farming standard framework (Usher et al., 2013). Gender discrimination is significantly reduced under organic farming standards with these organizations promoting equality in the workplace and since women do not have the worry of toxic chemical exposure affecting pregnancy.

Better Cotton Initiative and The Textile Exchange have reported positive results for farming standards in developing communities that can be attributed to their

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implemented framework (Usher et al., 2013). Any organic cotton initiative partnering with farmers provide reports, articles, and case studies discussing social benefits of organic cotton farming improvements and reporting numbers, and outline the common social issues identified in poor farming communities.

Transparency needs to be established between consumers of cotton garments and the farming process. Increased consumer awareness could support for organic cotton products, and would improve the economic support to farmers. Organizations could be motivated in the cotton industry and conventional cotton farmers to transition to organic methods (Textile Exchange, A Year in Review, 2013). Increased support for organic cotton farming will improve the quality of life for the farming communities, and reduce the rate of emissions, during the production process that effect climate change.

2.4 Economics of the Cotton Garment Industry

Organic cotton farming production is directly connected to the garment industry. To examine the future strength of the organic cotton garment industry the organic cotton market needs to be analyzed. Past production trends, anomalies, and future forecasts help reduce risk and predict price trend and availability of organic cotton garments.

2.41 Cotton as a Commodity

The organic cotton industry is considered a niche-market consisting of slightly more than 1% of the total cotton market (Kogg, 2003; Mohammadioun, Gallaway, & Apodaca, 1994; Ton, 1999). A niche market good is a specialty product within a larger market that is directed at a targeted demographic or marketed group (Myers & Stolton, 1999). Organic cotton farmers have an option to insure their crop for an additional price premium that compensates farmers in cases of crop failure at a rate above the value of

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conventional cotton. Price premium is reflected in the final price of the organic cotton garment and helps to reduce pressures associated with production that frequently occur in most geographical locations (OTA, 2012).

The Textile Exchange is an international non-profit organization that compiles global data pertaining to organic cotton production and releases annual reports breaking down the data by country and year. Data is collected from research done by multi-stakeholder international organizations and initiatives with the shared goal of expanding the organic cotton market. These organizations, initiatives, and agencies provide access to research, financial support, education, and a way for farmers and potential buyers to connect. The 2011 Cotton Briefing, released by the Textile Exchange, provides data for organic cotton production that supports the premise that farmers transitioning from conventional to organic methods gain economic security and long-term sustainability in the industry.

2.42 History of the Cotton Market

Over two centuries ago the mechanized cotton industry was one of four key sectors responsible for the industrial revolution (the other three being iron founding, steam power, and cheap labor). In the late 1980's, the first experimental commercial crop of organic cotton was grown in Turkey, which introduced a new revolutionary and sustainable method of commercial cotton farming (Myers & Stolton, 1999). Sathe and Crooke conducted a case study that looked at the introduction of organic cotton onto the market and how it developed. Sathe and Crooke (2010) break down the sectors of the market into participants of the multi-investor system; the stages of the supply chain, and the individual parties involved that provides an accurate and detailed depiction of the

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various processes. The production process of a cotton garment goes through many processes and is transported several times before reaching the consumer, as seen in

Figure 1.

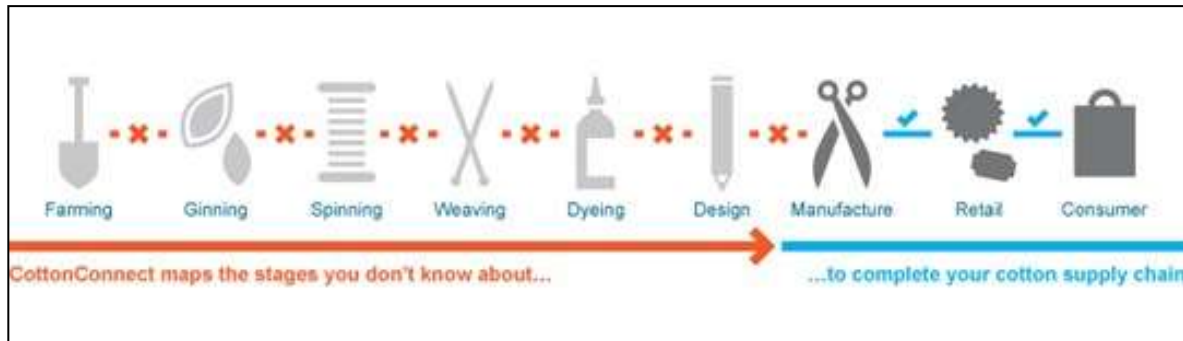


Figure 1. Supply chain of a cotton garment. The illustration is a visual of the production process that cotton goes through in sequential order, starting at the growing process and ending with the consumer. Source: <http://www.cottonconnect.org>

2.43 The Current Cotton Market

Organic cotton is a relatively new product in the cotton market, and is still in the development stages. Understanding the production processes, previous successes and failures, and how the industry is designed will help to improve the outlook of this commodity. Organic cotton is in a position to have continuous long-term growth in the cotton market.

Most available data about organic cotton is derived from the reports written by BCI or Textile Exchange. Both of these organizations publish their research and findings on forums and reports made available to the public (Paige & Ritchie, 2009). These organizations have conducted extensive research globally on both conventional and organic cotton farming, and are considered the leading source for accurate and up to date data. A majority of the data reviewed and analyzed in this paper is information that originated from annual reports, audits, and case studies made available by these organizations.

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There are numerous initial economic benefits for cotton farmers that want to transition their farm into the organic alternative. The initial costs to farmers are reduced due to the savings gained from not having to purchase chemical fertilizers and pesticides. Over the course of the first harvest additional savings will be gained from the reduction of resources consumed, such as water and additional chemical additives (Page & Ritchie, 2009). As more data is published about the economic feasibility of organic farming, the numbers of farms making the transition also rises.

Total cost of inputs to the cotton farmer is a significant economic measure; which emphasizes the potential profitability and viability of the organic cotton market. Organic cotton is grown with less chemical inputs, but more labor is needed to monitor the crop for potential infestation and diseases, as well as weeding and harvesting the crop (Sathe & Crooke, 2010). When comparing the data recorded for the costs and revenue from conventional and organic cotton farms the organic farms have a reduced overall cost and increased revenue.

2.44 Future Cotton Market Outlook

To produce the comparison graph of conventional and organic cotton markets and projecting future trends, data was used from two different sources. The Food and Agriculture Organization of the United Nations database was used to gather the numbers of total global cotton and total global organic cotton production and Textile Exchange produced the numbers for the organic cotton global production. These two suppliers of data allowed for a production comparison analysis of the output supply within the garment industry.

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To predict the future viability of the industry, current and historical trends are reviewed and analyzed in relation to the total cotton production trends. Weather conditions, political and economic policy changes, and other regional abnormalities are considered when reviewing the data in order to account for any anomalies. When production levels are increased, retailers become more willing to incorporate the organic products into their stores, because there is a reduced risk of supply shortages that could occur from crop failures.

2.5 Consumer Behaviors and the Organic Cotton Garment

A majority of the consumer behavior literature is made up of studies researching different variables that consumers entertain when purchasing eco-fashion. These authors offer knowledge and data that relate to the nature of organic consumer demand. The studies explore the relationship between consumers and their willingness to support environmental justice through purchasing organic products. The research is compiled to further investigate reasons for organic cotton garment purchases, and asks when consumers are buying the organic cotton garment does it imply their support for a different production model.

Clothing purchases are different from other consumer products, because fashion items can be considered part of the consumer's identity. According to Niimimaki (2010), when an environmental friendly alternative product is introduced to the consumer, consumer personality characteristics (internal) and convenience (external) influence the purchasing decisions, because we express our identities through fashion. Morgan and Birtwistle (2009) identify a link between increased garment purchases and a rise in the

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disposable habits of society. They conclude that efforts need to be made to reduce this careless behavior.

2.51 How Consumers Consume Clothing

Consumers have increased their clothing consumption in recent years with the introduction of fast-fashion. Fast-fashion is defined as apparel that represents the most current trends, is produced at a fast rate, and sold at a low price. “A recent study by the Environment Select Committee revealed that the proportion of textile waste being discarded at council refuse collection points in the past five years has increased from 7% to 30% by weight” (Morgan & Birtwistle, 2009; Poulter, 2008). There is now a need to make a shift towards a more sustainable textile industry, one that reduces waste and harm to the environment. Synthetic materials are not the answer; they are not biodegradable or recyclable and are increasingly being tossed in to the landfills (Morgan, 2009).

The buying behavior of organic garments dictates the future of the organic cotton market. Consumers, predominately in developing nations, have considerably shortened the life cycle of their wardrobe in recent years (Claudio, 2007). Consumer disposable clothing mindset encourages unsustainable farming in order to provide the cheap prices needed to sell poor quality garments that can be thrown away shortly after they are purchased (Morgan & Birtwistle, 2009). “However, possessing “consumer sophistication” is no guarantee that consumer actual participate in wide or ethical buying practices” (Titus & Bradford, 1996).

2.52 Eco-Fashion Consumption

It is important to understand what motivates the consumer to purchase eco-fashion products in order to predict future trends in the market, as well as how to develop

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marketing strategies to maximize consumer purchases. There is currently very little research on consumer behavior relating to eco-fashion purchases (Niinimaki, 2010). Understanding the previous mentioned will assist with the future outlook of the organic cotton market.

The consumption of clothing apparel is considered as any and “all activities related to acquiring, storing, using, maintaining, and discarding apparel items” (Winakor, 1969). Environmental consumption refers to any topic regarding the environment and ecosystem, such as climate change, the disposal of toxic wastes, species conservation, and water quality (Kim & Damhorst, 1998, Lin, 2008). The reactions of consumers when faced with issues regarding environmental and apparel consumption is what is measured in the studies reviewed for this paper.

Stephens (1985) wrote the first paper exploring consumer behavior in the apparel industry, explaining environmentally “responsible clothing” consumption attitudes, clothing acquisitions, and disposal. “Responsible clothing” can be identified with the term eco-fashion; it is a garment that has minimal environmental impacts during the production process. When a consumer makes an ecological decision while purchasing a clothing product, it means that they made a purchasing decision based on the avoidance of a product that is harmful to the environment (Roberts & Bacon, 1997). Prior to 1990 there was a limited amount of research conducted regarding consumer buying behavior (Hunt & Vitell, 1992; Niinimaki, 2010), since then there have been numerous studies, but few that focus specifically on eco-fashion purchases.

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2.53 Internal Influencing Factors

Internal influences for consumers are personality characteristics and key demographics that the consumer identifies with. “Clothing and fashion consumption converge strongly with the construction of self and one’s own individuality, in order to express deeply one’s own personality, such as ethical values and aesthetic preference” (Niinimaki, 2010). Internal influences are equally involved in the consumer’s decision-making process as external influences.

The studies that have been conducted regarding consumer purchasing behavior with eco-fashion products have had mixed results, lacked specificity, and have not identified a standard system to measure consumer motivations. The most common conclusion from these studies has made the claim that environmental issues do not outweigh the other factors considered when making a purchase (Cotton Incorporated, 2008; Niinimaki 2010). Research continually demonstrates that, “being fashionable and environmentally concerned appears to be in direct conflict” (Solomon & Rabolt, 2004). For this reason alone more research should be conducted to find out how consumers weigh the influencing external factors against each other when purchasing an apparel item.

2.531 Personality Influences

Individual consumer personality types are one of the least consistent factors identified throughout the compilation of studies. Each report developed unique labels and categories without any standard identifiable norm. The most effective personality labels used in these studies that could quickly and easily observed, identify and categorize

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personality types in the research study published by Myers and Stolton. This study identified four types of eco-fashion consumer.

Myers and Solomon (1999) developed a standard to measure four different personality types in consumers, and how these personality types typically interact when presented with the option to purchase an eco-fashion product. Four types of personalities from most likely to buy to least are the committed consumer, health conscious consumer, sympathetic consumer, and the casual consumer (Myers & Stolton, 1999). These studies provided a clear and concise way to measure and identify personality types in conjunction with additional variables.

Niinimaki (2010) conducted a study summarizing research on the personality traits of consumers that dictate their decisions regarding eco-fashion purchases.

Niinimaki, Solomon and Robolt, (2004) all focus their research on consumer ethics, which is an area difficult to quantify into measurable data. Most of the research identifies a correlation between the level of ethical commitment of the consumer and their willingness to sacrifice convenience. The higher the level of ethical commitment portrayed by the consumer, the more likely they will base their purchasing decisions on their values compared to the average consumer (Niinimaki, 2010).

2.532 Demographics

James A. Roberts (1996) conducted a research study that showed a significant relationship between consumer income levels and ethical purchase decisions based on a regression analysis of the data collected. These results were in contrast to previous research that concluded that there was no relationship between these demographics (Roberts, 1996).

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Other studies reported that genders also played a role in consumer purchase decisions, showing that women were more likely to make a decision based on ethics and the environment than men (Eagly's, 1987; Roberts, 1996; Roper, 1992). The results from these studies showed that both men and women will purchase environmentally friendly garments, but women will purchase the garments more often based on their principles, and men will purchase the garments more often based on the price. Demographics including income, age, education, and gender have shown some regular findings regarding consumer behavior, but the results are not consistent.

2.54 External Influencing Factors

Consumers are influenced by external factors such as store related attributes, the physical qualities of the garment, convenience to the consumer, and marketing. These factors may influence the consumer decision consciously or subconsciously, and the most common external factor that influences consumers, according to Carrigan and Attala, are factors of convenience. Store and product attributes have also shown to have a significant influence on consumers concurrently with the convenience to the consumer. Some common convenience factors are price, quality, value, comfort, and consumer compatibility (Carrigan & Attalla, 2001; Thøgersen, 1999).

2.541 Labeling and Marketing

Consumer education and marketing strategies are external influences that have shown to be significant factors motivating consumers to make eco-fashion purchases. Advertising in the following literature refers “to the public, by any means other than a label, that is intended or is likely to influence and shape attitude, beliefs and behaviors in order to promote directly or indirectly the sale of organic products” (Council Regulation

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(EC), 2007). Many consumers do not have a clear understanding of some common eco-fashion terms adding to the confusion and lack of consumer confidence (i.e. green apparel, green fashion, and organic cotton) (Solomon & Rabolt, 2004). Consumers identify the term organic as something that relates to food, not with their clothing.

When Patagonia, a large outdoor clothing retailer, conducted a survey about organic cotton they received responses corroborating other research that concluded consumers do not understand eco-fashion terms. One response Patagonia received was, “Why *organic* cotton? I don’t eat my jeans!” (Sathe & Crooke, 2010). The absence of detrimental effects a garment has directly to the body has caused the means of the organic properties to be discounted by the consumer (Beard, 2008). Clear labeling, marketing strategies and ongoing consumer education will continue to improve consumer understanding regarding the sustainable efforts behind the organic cotton market.

2.542 Convenience Factors

The research showed that consumers would initially look at the price of the garment and its design (Wilson, 2004). Although environmental issues have shown to influence purchasing decisions, convenience factors predominantly take precedence with consumers when they are making their purchase decisions (Butler & Francis, 1997). Price has consistently shown to be the most influential factor for consumers based on existing research (Thogersen, 1999). The majority of consumers display positive attitudes regarding eco-fashion products, but their purchasing decisions usually do not reflect their attitude, instead consumers report that the price of the eco-fashion garment discourages them (Cotton Incorporated, 1999; Cotton Incorporated, 2008; Eckman, Damhorst, &

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Kadolph 1990; Meyer, 2001; Garlick & Langley, 2007; Iwanow, McEachern, & Jeffrey, 2005).

2.6 Methodology

The most significant piece of literature that was used as a model for the survey created for this report was a consumer behavior paper on consumer's and eco-fashion. Ting-yan Chan and Christina W.Y. Wong (2012) conducted a multivariate study consisting of key consumer demographics and their relationship with various external factors regarding eco-fashion purchases. The goal of the study was to improve the understanding of consumer eco-fashion purchase decisions, specifically focusing on ethical decision making and marketing influences (Chan & Wong, 2012).

A pilot study conducted for this thesis adds consumer data collected in Seattle, Washington. Previous studies have focused on populations of large international cities, such as Hong Kong and London, or focused on key demographic groups. Residents of Seattle were identified as a progressive population with an above average income. "Seattle median household income was \$52,048 in 2011, about 15% higher than the US median income of \$45,000. Seven of eight population groups in Seattle have higher median incomes than their national counterparts" (City of Seattle Office of Economic Development (2013). Seattle is known as a population that supports the organic food movement, and there have been studies showing a positive relationship between the purchase of organic foods and whether that person would purchase organic clothing (Beth, 2004; Ochoa, 2011; Wilson, 2004). This sample population group provides an ideal group for data collection to verify the previously stated relationships between

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income and ethical purchasing behavior and is ideal for organic cotton companies to target potential advertising and marketing campaigns to increase sales.

The organic cotton production and garment industry are recent emerging markets that are underdeveloped and under-researched. Lack of research expands across seed development, the growing process, and eco-fashion behavior. Research on the production side lacks funding, and even when case studies are done, the resulting conclusions most likely would be privately funded and go unpublished (Page & Ritchie, 2009). The demand side of the organic cotton industry is a newer market as well as complicated to research. The continuation and improvement of research in this industry is needed to provide stronger evidence and stimulate change.

Chapter Three

The Interwoven Organic Cotton Garment

3.1 Introduction

This chapter outlines socio-economic differences, physical geography of cotton production, environmental costs associated with conventional cotton production, the alternative costs of organic production, consumer decision-making, and efforts to expand the organic cotton production and consumption. The following information offers a better understanding and background of the organic cotton industry and its benefits over conventional cotton. Differences in cotton production knowledge, social costs, and the market element breakdown explores the potential need for the organic alternative market expansion. Consumer behavior research offers a better understanding of eco-fashion drivers. Consumers drive the supply and demand of the organic cotton garment industry, and extracting the significant influences will help build business strategies that will encourage the growth of the organic cotton garment industry.

3.2 Cotton Garments and Retailers

A finished organic cotton garment is indistinguishable from a conventional garment (Casadesus-Masanell, et al., 2009). Garments can also be constructed up of a blend of organic and conventional cotton and can be labeled and certified accordingly. This following research will focus on the garment that is a 100% produced with certified organic cotton.

3.21 Conventional Cotton Garments

The conventional production methods used to produce cotton garments require a significant amount of energy and water throughout the stages of the supply chain

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(National Geographic, 2013; Winkle, 1978). “It can take more than 20,000 liters of water to produce 1kg of cotton; equivalent to a single T-shirt and pair of jeans” (Pesticide Action Network, 2014). One conventionally produced cotton t-shirt requires 2,700 liters of water to produce, and that along with the energy needed during manufacturing, transportation, and production makes this product one of the most input intensive goods available to consumers (Myers & Stolton, 1999; National Geographic, 2013).

3.22 Organic Cotton Garments

Organic cotton garments have a lower impact on the environment during production than other clothing alternatives (Laub, 2005; Mirza, 2004). Organic garments are considered, “garments made with natural materials that are produced using components that have a low impact on the environment, offering doubtless benefits not only to the environment but to the producer’s health and well-being” (Moral Fiber, a beginner’s guide to the UK market, 2005). Eco-fashion is often marketed and found predominately in the United States and Europe (Chen & Wei, 2012).

If additional organic material is used such as, buttons, clasps, and thread, there is a potential for an increase in production cost. The dyeing process is also an area of diversification. The methods for dyeing the cotton fiber also vary between conventional and organic methods. Conventional dyes use chemicals that, organic, or the fiber can be left in its natural state (Solomon & Rabolt, 2004). If other organic cotton garments use naturally pigmented dyes then “resources could be saved and levels of dye in effluent reduced” (Myers & Stolton, 1999).

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3.23 History of the Organic Cotton Garment

Certified organic clothes were first sold in the early 1990's in all natural and health food stores, the products offered were limited in colors and style and capitalized on the environmental and health benefits. A few companies did begin to market organic cotton in more stylish trends and natural colors until the 1994 until they were unable to compete with the emerging fashion trend using bright neon dyed synthetic fabrics (International Trade Center).

Since the early twenty-first century organic cotton has been re-introduced by retailers. For environmental reasons, ethical reasons, and out of necessity eco-fashion was reintroduced and slowly establishing itself avoiding the fad image it once took. Some of the largest clothing retailers in the world are now incorporating the sustainable fiber and have voiced their plan for future eco-fashion expansion. Companies, like Patagonia, have sustained themselves when converting to only organic cotton clothing and have positive numbers to report backing up their success.

3.24 Retailers

The first big retail companies to design and sell organic cotton garments was Hennes & Martiz (H & M), Patagonia, and Esprit in the early ninety's. By 1994, Gap Inc., Esprit, and Levi's had experimented with the eco-friendly fiber, but pulled out of the organic industry as the demand for organic fiber dropped because of the fashion shift. During this time European companies, OTTO, Hess Natur, and Coop, were the companies left supporting the organic cotton market.

The production of organic cotton is predominately managed by two companies, Mavideniz in Eastern Turkey and Eco-Farms in Maharashtra, India. This small-enclosed

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distribution channel sells 50-60% of their production to twenty-five of the largest organic cotton consuming retailers (Hulm, 2008). Retailers such as Nike, Patagonia, Hess Natur, OTTO, and Coop have been credited for shaping the organic cotton market, which shows that this developing niche still relies on the big brand retailers (International Trade Center).

More recently, companies have increased their organic cotton use through conversion programs that uses the blending of sustainable fiber with other material to incorporate organic cotton while making their products affordable. The demand for organic cotton garments has created a market that now offers a selection of eco-fashion garments, which are sold from specialized boutiques, high-end department stores, and electronic commerce (International Trade Center). Table 2 shows the leading companies of the organic cotton movement and the locations of sales.

	2007	2008	2009	2010	2011
1	Walmart/Sam's Club	Walmart/Sam's Club	C&A	H&M	H&M
2	Nike, Inc.	C&A	Nike, Inc.	C&A	C&A
3	Coop Switzerland	Nike, Inc.	Walmart/Sam's Club	Nike, Inc.	Nike, Inc.
4	C&A	H&M	Williams-Sonoma, Inc.	Inditex (Zara)	Inditex (Zara)
5	Woolsworth's South Africa	Inditex (Zara)	H&M	adidas	Anvil Knitwear
6	Anvil Knitwear	Anvil Knitwear	Anvil Knitwear	Greensource	prAna
7	Coop Switzerland	Coop Switzerland	Coop Switzerland	Anvil Knitwear	PUMA
8	Greensource	Pottery Barn	Greensource	Target	Williams-Sonoma, Inc.
9	Levi Strauss & Co.	Greensource	Levi Strauss & Co.	Disney Consumer Products	Target
10	Target	hessnatur	Target	Otto Group	Otto Group

Table 2. Top ten organic cotton retailers. Source: Textile Exchange, 2010; Global Report, 2011.

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3.25 Supply Chain

The production of cotton garments is a complex decentralized multi-stage system starting at the cotton farm, and ending in retail stores. The supply chain of a garment, as seen in Figure 2, consumes energy, water, oil, and chemicals throughout the process as it

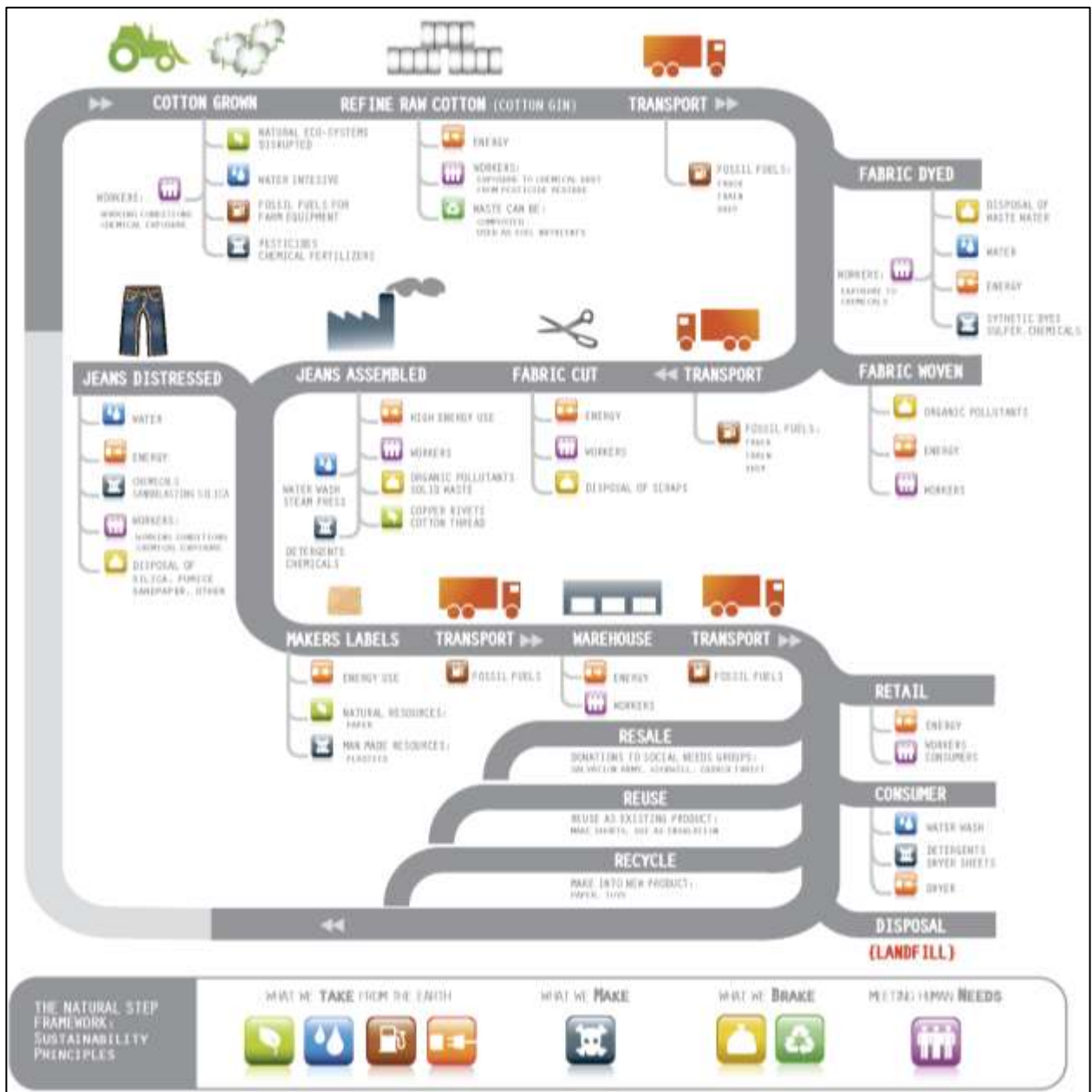


Figure 2. The supply chain of inputs in cotton garment manufacturing. Source: Rutgers University Libraries, 2014.

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simultaneously disrupts and pollutes the land. Once the cotton is harvested, the raw material is transported to a ginning factory where the fiber is separated and cleaned. This cleaned fiber is then transported to a weaving mill where it is transformed into cloth that is ready to be dyed and finished. These factories and mills process both organic and conventional crops, and must be separated throughout these stages to preserve the purity of the organic cotton. Each machine must also be thoroughly cleaned prior to introducing the organic cotton. From this point, the cotton is transported to factories where it is assembled into the end product and shipped to the retail stores.

Organic cotton, although challenged by the cost of cleaning the machines and the lack of large quantity cost savings does have an advantage. Organizations and initiatives like, The Better Cotton Initiative, offer informative tools that look at the supply chain to better assist in the reduction of waste and improve of the system used by small business buying organic cotton from farmers. Organizations dedicated to increasing the organic cotton market continually make an effort to reduce costs to farmers on an individual level (Textile Exchange, Cotton Briefing, 2011).

3.3 Cotton Production

Commonly thought to be environmentally friendly, cotton harvested and refined through conventional methods is one of the most input-intensive systems in the world (Myers & Stolton, 1999). Conventional cotton production methods can be just as harmful to the environment as the comparable synthetic petroleum based products (Patagonia, 2006). This contradictory concept of cotton production is due to the lack of transparency through the industry and consumer knowledge of production methods. Both descriptions of cotton are true depending on how it was harvested and refined.

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3.31 Differences in Cotton Production

Cotton is produced through conventional and organic methods, providing the same end product with drastically different harvesting and production methods (Casadesus-Masanell, Crooke, Reinhardt, & Vasishth, 2009). The majority of cotton is produced through the high input intensive conventional methods responsible for its nickname “the dirtiest crop” (Illge & Preuss, 2012; Myers & Stolton, 1999; Winker, 1978). Organic cotton farming is produced through small-scale farms that use GMO free seeds and practice sustainable methods that do not involve chemicals, full irrigation systems, and dependent on fossil fuels (Textile Exchange, Cotton Briefings, 2011). “Organic cotton production is knowledge-intensive; it combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved” (Textile Exchange, Cotton Briefing, 2011). The farming, harvesting, and production of cotton are what differentiate organic from conventional cotton (Casey, 2007).

The final products are comparable and indistinguishable at the macroscopic level (Casadesus-Masanell et al., 2009). The quality of organic cotton, similar to conventional cotton varies greatly based on the seed, growing conditions, and the region that it was grown in (Textile Exchange, Cotton Briefing, 2011). Samples taken from both types of cotton have comparable fiber length, strength, and micronaire (Myers & Stolton, 1999).

Conventional cotton production does not produce a higher fiber yield. Preliminary results from the Center of Agroecology and Sustainable Food Systems at the University of California found no significant differences between the yields of conventional and organic cotton (Myers & Stolton, 1999). Evidence has been actually found that mature

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organic farms can have higher yields than conventional cotton crops (Textile Exchange, Cotton Briefing, 2011). As organic cotton crops mature more yields are produced. In the US from 2011 to 2012 acres of planted cotton decreased, but the harvest actually increased by 60% (Jagiello, 2014). This is most likely due to established organic fields, weather, and experienced organic farmers.

Organic farming practices provide a product that is environmentally friendly and sustainable, and improves the community, local economy, and quality of life for the farmer (Myers & Stolton, 1999; Organic Cotton, 2013). This method of production has minimal impact than the alternative conventional method. Choosing organically produced cotton garments create a different set of sustainable goods that improve social conditions for both producers and consumers.

3.32 Geography as it Pertains to Cotton Farming

Cotton's adaptability makes it a viable crop for most countries and both organic and conventional cotton are grown in most parts of the world, as seen in Figure 3. A majority of cotton (approximately 99%) is produced in developing countries on small-scale farms that produce 75% of the global cotton output (Organic Trade Association, 2014). The physical terrain and geographical features dictate the amount of resources needed, the type of cottonseed used, and how much cotton can be yielded in a given harvest. The location and government in the region also affects the costs throughout the production process. It is important to understand how the regional climate conditions and geopolitical variations impact and shape the conventional cotton market.

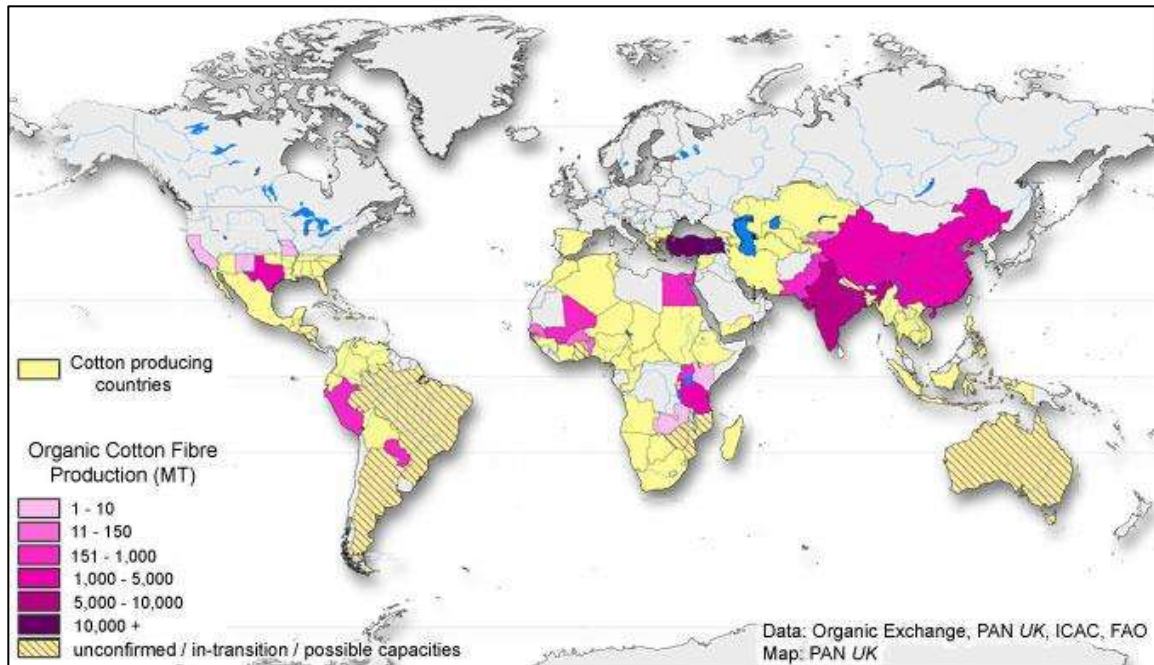


Figure 3. Organic and conventional cotton farming production. Source: Pesticide Action Network, 2014.

Cotton grows best in hot dry climates, but produces the most yields when the plant is watered during specific times throughout the season (Truscott et al., 2013). The cotton plant produces its highest yields in fertile soil that is rich with minerals, moisture, and organic matter. The plant requires nitrogen, sulfur, molybdenum, and manganese to grow and, phosphorus, potassium, calcium, magnesium, boron, and zinc to flower and produce fiber (Gibbs, Dufour, & Guarena, 2005). Choosing the appropriate cottonseed is the most important factor to maximize a cotton farms yield from a harvest. If the correct seed is used, based on the climate and soil conditions, there will be a reduced chance of pest infestations, more efficient watering systems that utilize the regions precipitation trends. The farms will be able to produce the best fiber quality and quantities by choosing a plant that grows during the specific regional harvest times (Page & Ritchie, 2009).

The majority of cotton farming and production occurs in developing regions, providing an end product for consumers in wealthy developed nations. Cotton is

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produced throughout the world in both small-scale and large commercial farms. In 2001, the United Nations Food and Agricultural Organization estimated that there were over one hundred million rural households involved in cotton farming and production globally (Page & Ritchie, 2009). Commercial cotton farming is embedded in both developed and developing global economies, where a more mechanized process is used (Myers & Stolton, 1999; Textile Exchange, Cotton Briefing, 2011).

Conventional cotton production can be developed on small-scale farms or on a commercial scale. Farming production occurs in over a hundred countries covering six continents (Warrick, 2013). As seen in Figure 4, China and India are responsible for

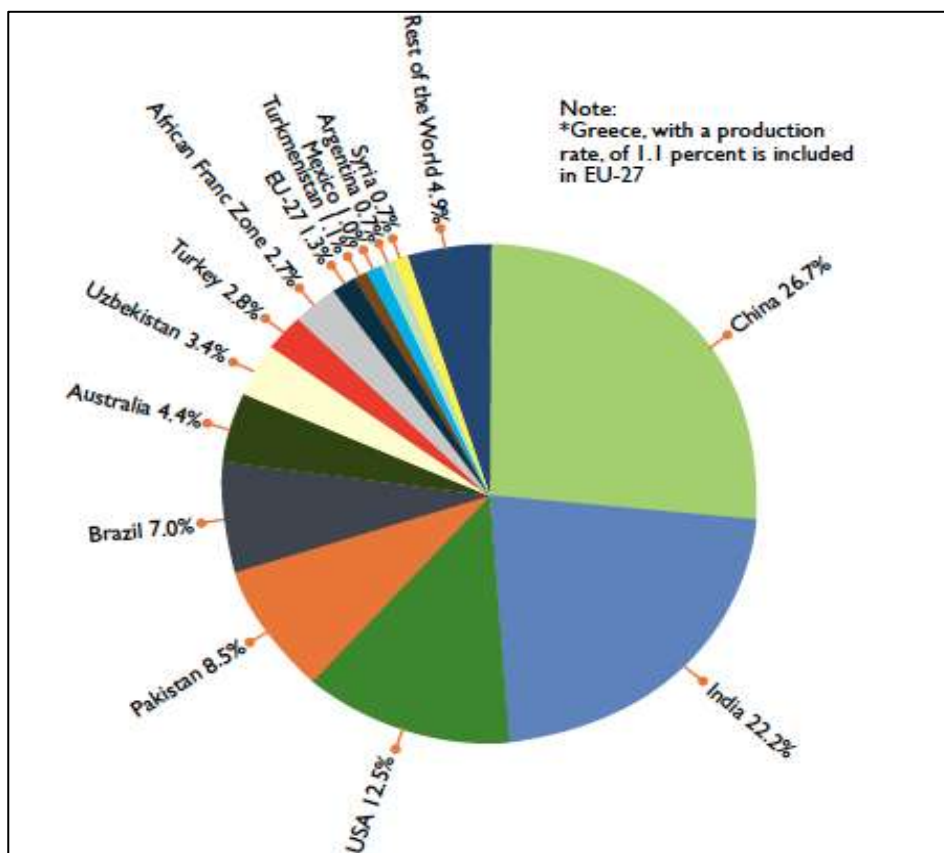


Figure 4. Conventional cotton global production by country. Source: Truscott, 2013.

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growing almost half of the conventional cotton of the world (Meyer & McDonald, 2014).

A regions climate can depict the quality and yield, for example, Turkey is known for its quality cotton fiber and highest cotton yields globally (Textile Exchange, Turkey, 2013).

Organic cotton, desired for its fiber characteristics and its sustainable production method, is farmed globally. Organic cotton farms started in the United States and Turkey in the early 1990's, and now it is being grown in over twenty-two countries, as seen in Table 3 (Casabona, 2010; Organic Trade Association, 2014; International Trade Center).

country	fiber production (mt)	fiber production (% of total)
[1] India	103,003.52	74.20%
[2] Turkey	15,802.00	11.38%
[3] China	8,105.53	5.84%
[4] Tanzania	6,890.90	4.96%
[5] USA	1,580.00	1.14%
[6] Mali	860.00	0.62%
[7] Peru	478.50	0.34%
[8] Uganda	455.70	0.33%
[9] Egypt	420.00	0.30%
[10] Burkina Faso	370.00	0.27%
[11] Benin	328.00	0.24%
[12] Kyrgyzstan	156.00	0.11%
[13] Nicaragua	122.00	0.09%
[14] Paraguay	100.00	0.07%
[15] Israel	70.00	0.05%
[16] Brazil	37.79	0.03%
[17] Senegal	17.35	0.01%
[18] Tajikistan	16.00	0.01%
total	138,813.30	

footnote:
 * No data from Syria (production continuing, but no export due to civil unrest)
 * No data from Pakistan (presumed to have ceased production)

Table 3. World's organic cotton fiber production. These are the top organic cotton producing countries as of 2011-2012. Source: Textile Exchange, A Year in Review, 2013.

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Today, the majority of organic crops are produced in China, India, and Turkey; with India being the largest producer of organic cotton (Illge & Preuss, 2012; Truscott, 2013).

Harvested cotton is then transported to the spinning mills for ginning, where the fiber is separated from the seeds and cleaned (Textile Exchange, Snap Shot, 2014). Most, but not all, organic cotton spinning mills can be found in the same top organic cotton producing countries (see Figure 5) such as India and Turkey (International Trade Center). Other mills are located in developed countries including China, the United States, and Pakistan, as well as developing countries such as Peru, Portugal, Thailand, Switzerland, and South Korea. Once cotton is spun in these mills it is transported to different facilities, sometimes countries apart, and processed through the stages of weaving, dyeing, and garment construction (International Trade Center).

The decentralized structure of the conventional cotton industry creates unneeded costs from transportation, as well as increased emissions that could be avoided with a centralized system of production. Conventional dyes are made from petroleum based synthetic chemical processes that result in greenhouse gas emissions, additional costs based on the volatile oil market, and challenges in disposal of hazardous toxic chemicals from the dyeing process. These hazardous dyes can only be produced and disposed of properly at specific centralized factories, and present a logistical challenge and major cost to cotton production, as well as to the problems associated with global climate change. Using an organic production method from harvest to final construction of a cotton garment would eliminate these costs, provide a centralized area of production, and reduce the overall environmental impact (Massachusetts, 2003).

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Physical terrain, geographical location, and climatic factors within the region where the cotton is farmed are determining factors in whether or not there is a successful harvest. The climate and abundance of natural resources within the cotton producing regions impact the amount of cotton that can be yielded (Myers & Stolton, 1999; Sathe & Crooke, 2010). Utilizing the cottonseed that is appropriate for the region can reduce the likelihood of crop failures from droughts, infestations, and diseases (Page & Ritchie, 2009). Governments and organizations often dictate the type of cottonseed a farmer can use, which is not always based on these specific regional factors (Myers & Stolton, 1999).

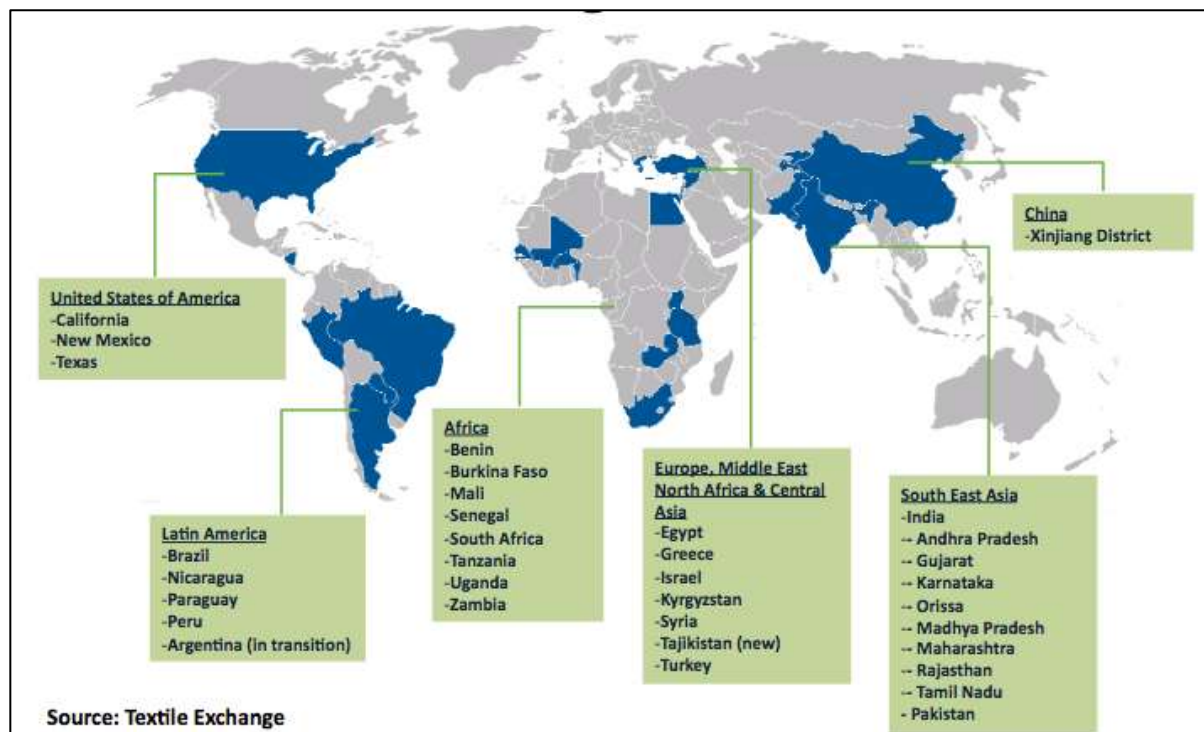


Figure 5. Geographic locations of organic cotton producers. Source: Textile Exchange, Creating Material Change, 2011.

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3.33 Geopolitics

The conventional cotton industry is comprised of large corporations and organizations that are motivated to maximize their profits. The developing regions, where the majority of conventional cotton farming takes place, provide geopolitical environments tailored for this profit maximization. Organizations and companies in the conventional cotton industry exploit the lack of governmental regulatory oversight and rampant corruption within these regions in order to develop non-competitive monopolized industries. The United States is the largest exporter of conventional cotton in the world, the United States cotton farmers benefit from the government subsidies that are offered keeping prices of cotton low and production high (Claudio, 2007). Some countries have removed the subsidies leading to the added price of pesticides and insecticides, for the crop to remain competitive in the market this increase in cost cannot always be passed on to the buyer and is absorbed by the farmer (Myers & Stolton, 1999).

These organizations can develop agreements with the regional governments to regulate farming methods, subsidize cotton crops for export, and encourage farmers with limited revenue options to harvest their crops. The geopolitical environment for these farmers, and their communities, does not provide them with any opportunity to make decisions about the careers that affect their livelihood. Sustainable farming methods have started to become more profitable than conventional cotton farming with more rationalized production methods increased through environmental legislation (Myers & Stolton, 1999).

The current conventional cotton industry exploits local farming communities in developing regions to increase their profitability. “In-country subsidies are designed to

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protect the agricultural sector within the country. Current legislative standards do not support sustainable production methods; instead they create an inequitable environment capitalizing on the inability for developing countries to compete in “free markets.”

Organic Cotton value chains can help improve these vulnerable rural economies through trade, not aid, solutions” (Textile Exchange, Cotton Briefing, 2011).

The United States, China, Turkey, India, and the World Trade Organization (WTO) all have a vested interest and ability to influence existing and future legislative and trade policies regarding the subsidization, importation and exportation of cotton crops. Individual nations need to be regulated by set international standard in order to provide an equitable and transparent system for cotton farming standards at an international level. Currently, cotton crops are subsidized and controlled within individual countries, and these legislative procedures affect the entire global cotton industry. An example of this is apparent when looking at global cotton production levels from 2007-2009. Conventional cotton production was severely reduced due to the economic recession in the United States that affected the entire cotton market sector. Organic cotton production, being a niche product within this market, was able to increase in 2007-2008 despite the negative economic effects of the recession. In 2008, India, the leading organic cotton producer, started implementing increased regulation on organic cotton and this had a devastating effect on the total global production of organic cotton.

3.34 Environmental Costs of Production

Conventional and organic cotton farming have different impacts on the environment. Conventional cotton farming methods tend to be more detrimental to the

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local ecosystem and introduce foreign elements. Organic farming is a more balanced method that utilizes the ecosystem that surrounds the crop and has minimal impact.

3.341 Conventional Cotton

Sustainability of these methods is just recently being questioned in developed industrial nations, such as The United States, Sweden, and Brazil (Page & Ritchie, 2009). Cotton production takes up 2.5% of the arable land and the wide practicing of non-sustainable farming has caused the arable land per capita to shrink from 4307 m² per person in 1961 to 2137 m² in 2007 (Textile Exchange, Cotton Briefing, 2011). In the United States large-scale farming is making a noticeable negative impact on the local environment and these companies are also encouraging the use of genetically modified (GM) cottonseeds (Page & Ritchie, 2009).

The hazardous inputs take energy and fuel to produce and then are sprayed onto the crops making its way into the environment and animals, and if it doesn't kill them the harmful properties can be passed onto future generations (Reeves, Katten, & Guzman, 2002). In Brazil, rising prices in fertilizer have made the cotton farming industry nearly unprofitable in recent years (Page & Ritchie, 2009). These problems developing in industrialized nations need to be used as examples to the industry providing an increase in awareness about the unsustainable conventional practices.

Conventional cotton farming utilizes the agricultural practice of monocropping, which economically can be efficient, but over time this damages the soil ecology. Monocropping is the agricultural practice of cultivating a single "crop that does not rotate with other crops in a particular field or area" (Oxford, 2014). One reason conventional cotton production is unable to practice crop rotation is the use of the highly hazardous

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application of WHO Class 1 (Page & Ritchie, 2009). This pesticide is so potent that it increases the risk of contaminating the food crop that is planted in the soil the following growing season. Economically, the process can be efficient and profitable for the



Figure 6. World's cotton yield and acreage with projection. The projected trend line does not share the same incline as acreage coverage, displaying that future yield produced per acre will decrease. Source: Hudson, Mutuc, & Ethridge, 2012.

conventional industries because it allows for the specialization of equipment for a single crop increasing production outputs. However, the issue with this process is that over time a single crop depletes the same minerals and nutrients in the soil, and can damage the ecosystem and it is more vulnerable to infestation. It is projected that acreage coverage

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will increase, but not at the consistent rate as yield output, which displays the unsustainable long-term process of conventional methods, depicted by Figure 6 (Hudson, Mutuc, & Ethridge, 2012).

Large amounts of synthetic fertilizers are applied during conventional farming. It can take almost a 1/3 pound of synthetic fertilizers to grow one pound of raw cotton in the US, and it takes just under one pound of raw cotton to make one t-shirt (Laursen, S.E.; Hansen, J.; Knudsen, H.H., Larsen, H.F., & Kristensen, F. M., 2007). Synthetic fertilizers use 1.5% of the world's energy to produce and production emits carbon emissions (Organic Cotton, 2013). The use of nitrogen rich fertilizers speeds up the mineralization of soil, depleting organic matter and degrading the soil quality (Myers & Stolton, 1999). To counter the depletion of nutrients in the soil, farmers use fertilizers, which help maintain the nitrogen and potassium levels high enough to continue farming. Eventually, the pH levels and organic material reach a point where the land is no longer arable (Page & Ritchie, 2009). These nitrogen and phosphorous rich fertilizers leach into the ground water causing eutrophication, which is the process responsible for harmful algal blooms (Myers & Stolton, 1999).

An artificial unchanged environment as a result of monocropping makes cotton crops vulnerable to infestations from parasitic and opportunistic organisms (Myers & Stolton, 1999). Conventional cotton farming supports 25% of the global insecticide market, 10% of the global pesticide market, and 6.8% of the global herbicide market with its intensive chemical use (Cluadio, 2007; Ecologist, 2013; Ethical Consumer, 2013; Warrick, 2013; Organic Cotton, 2013; Reeves et al., 2002; Sathe & Crooke, 2010). The reduction in biodiversity caused from these chemicals actually increases the threat of

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secondary pests, as a result from the removal of their natural predators (Organic Cotton.org). In California alone, thirty-five million pounds of pesticides were used on cotton crops (Solomon & Rabolt, 2004).

The same chemicals used in herbicides, pesticides, and other processes in conventional farming were used in the development of nerve gas during wartimes (Patagonia, 2006). These chemicals are most often labeled moderately to highly hazardous chemicals, as seen in Table 4 about insecticides. The most common pesticide used for cotton farming, WHO Class 1b³, is labeled as ‘highly hazardous’ and is extremely toxic to fish (Page & Ritchie, 2009). Aldicarb, the second most used insecticide on cotton fields, can kill a man with one drop absorbed into the skin (EJF, 2007). Twenty-five countries report using this chemical, the United States being one of them and sixteen states have found traces in the ground water (EJF, 2007).

Chemical name and trade name	Chemical Group	WHO toxicity class	Percentage share of global cotton insecticide market
<u>Deltamethrin</u> (Decis)	<u>pyrethroid</u>	II: moderately hazardous	12
<u>Lambda cyhalothrin</u> (Karate)	<u>pyrethroid</u>	II: moderately hazardous	9
<u>Monocrotophos</u> (Azodrin)	<u>organophosphate</u>	<u>Ib: highly hazardous</u>	9
<u>Alpha-cypermethrin</u> (Fastac)	<u>pyrethroid</u>	II: moderately hazardous	8
<u>Chlorpyrifos</u> (Dursban, Lorsban)	<u>organophosphate</u>	II: moderately hazardous	7
<u>Esfenvalerate</u> (Sumi-alpha)	<u>pyrethroid</u>	II: moderately hazardous	7
<u>Methamidophos</u> (TamaronB)	<u>organophosphate</u>	<u>Ib: highly hazardous</u>	6
<u>Dimethoate</u> (Rogor, <u>Perfekthion</u>)	<u>organophosphate</u>	II: moderately hazardous	5

Table 4. Prevalent insecticides used in cotton production. Source: Allan Woodburn Associates 1995

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Reason for even more concern is that these farming inputs are not always properly used and in the hands of individuals that may not understand the true serious harm they can cause. The miss-use of these chemicals also can counter the very reason they were created. Farmers are recommended to rotate the use of these chemicals in order to reduce the likelihood of pests developing a tolerance to persistent exposure from the same chemical (Page & Ritchie, 2009). The boll weevil, aphid, *Heliothis*, and *Spodoptera* have shown limited levels of resistance to these chemicals. The emergence of chemical resistant pests has prompted some farmers to abandon their farms, such as remote regions of India, Nicaragua, Guatemala, Pakistan, Egypt, and Sudan because of crop infestations from pests that are resistant to chemical eradication methods (Myers & Stolton, 1999). The overuse of pesticides has even destroyed \$150 million worth of cotton at a farm in Rio Grande Valley, Texas in 1995; these chemicals destroyed all of the pests, plants, and land. Another case of chemical oversaturation was responsible for the destruction of crops, pests, and arable farm land in Alabama, Mississippi and Tennessee (Reeves et al., 2002).

There are many disadvantages and negative impacts that arise from the chemicals used on cotton crops, see Table 5. Due to the extensive use of pesticides and insecticides, animals and humans living near cotton fields have reported higher numbers of birth defects, health problems with farmers using the chemicals, and increased wild animal mortality (Patagonia, 2006; Ecologist, 2013). The negative impact of pesticides has been most visibly noticeable on the amphibian populations, birds, fish, and other aquatic organisms (Kadolph & Langford, 2002; Myers & Stolton, 1999).

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Tool	Advantages	Disadvantages
Use of WHO Class I pesticides	Kills most pests	Highly toxic to humans and the environment; full protective clothing needed; kills natural enemies; high cost of pesticides and application equipment; intercropping with food crops banned
Use of protective clothing	Protects against toxic pesticides	Full protective clothing is expensive and uncomfortable in the tropics; replacement respirator cartridges are rarely available
Farmer training in scouting and using economic threshold levels	Trained farmers use pesticides more judiciously	Farmer training needed
Rotation of pesticides	Reduces the incidence of pesticide resistance	Farmer training needed
Use of ULV sprayers	Conserves pesticide and water	Higher level of technical support needed
Use of herbicides	Reduces weed problems; saves labour	Increases input costs; harmful to the environment
Use of chemical fertilisers	Increases cotton yields	Increases input costs; continued use reduces soil pH and SOM
Use of lime	Increases soil pH	Costly to transport to individual farmer's fields
Use of drip irrigation	Conserves water	Increases capital costs
Providing inputs on credit	Enables poor farmers to buy external inputs	Low prices paid for seed cotton may cause farmers to fall into debt
Monocropping and plant spacing	Increases cotton yields	Reduces biodiversity; reduces food security for smallholders
Use of defoliants	Assists picking	Increases input costs (risk of farmer debt); environmental risk
Grading cotton by picking into 2 bags	Graded seed cotton fetches a higher price	Pickers need training
Uprooting and destroying cotton plants after harvest	Reduces carry-over of bollworms	Increases labour costs

Table 5. The advantages and disadvantages of conventional cotton inputs. This table is a comparison of the pros and cons in the farming production process of growing conventional cotton. Source: Page and Ritchie, 2009.

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Conventional cotton is one of the most water dependent crops (Truscott et al., 2013; Patagonia, 2006; World Wildlife Fund, Cotton: a water wasting crop, 2014). Over half of cotton agriculture operates by full or supplementary irrigation systems and most are farmed with the traditional technique called flood irrigation, which reports an efficiency lower than 40% (Grasser, Salerno, & Thalmann, 1999; World Wildlife Fund, The Impact of Cotton, 2000). Barnes, the Associate Director of Agricultural Research at Cotton Inc., argues that cotton as a “water hog” is a made up fallacy (Ross, 2006), but there is evidence to the contrary, the agriculture sector receives and consumes as much as 70% of the world’s available water (Textile Exchange, Cotton Briefing, 2011). These irrigation methods contribute to the water dependency of these crops, causing excessive soil acidity from salinization, (Myers & Stolton, 1999) and contributes to water shortages (Textile Exchange, Cotton Briefing, 2011).

The pollution of ground and surface water from farming runoffs has had a significant negative impact on the regional flora and fauna and freshwater ecosystems (Reeves e al., 2002; Casey, 2007; World Wildlife Fund, The impact of cotton, 2000). The Aral Sea was once considered the fourth largest body of freshwater, but now is too polluted with saline and pesticides to support any fish (Truscott et al., 2013; Myers & Stolton, 1999; World Wildlife Fund, Cotton: a water wasting crop, 2014).

Harvesting the conventional cotton crop uses defoliant and heavy machinery to gather the cotton fiber. Defoliant is sprayed on the plant to stimulate cotton boll development and leaf drop, which enhances and reduces the cost for harvesting and ginning. The machinery uses more fossil fuel and can cover up the flaws in the cotton lessening the quality of the final product. “The string of environmental problems is

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continuing everyday by means of salinization, a loss of biodiversity, adverse changes in water balance, and pesticide-related problems including resistance” (Myers & Stolton, 1999). This chemical can also affect the health of the environment and life within the local area. Aerial defoliant application in California communities growing cotton has seen an increase in flu-like symptoms.

Conventional cotton continues to be the dominant textile in the garment industry and a significant crop among global agriculture. The plant/commodity good absorbs massive amounts of water and chemicals, contaminates the environment and the food chain, jeopardizing the health of the local community, and destroying the ecosystem. The farming of conventional cotton only harms the environment for the sake of textiles that are consumed and disposed at a rapid rate.

3.342 Organic Cotton Farming

Organic cotton uses farming characteristics that maintain the quality and availability of water, use pesticides responsibly, maintain the health of the soil, and preserve natural habitats (Page & Ritchie, 2009). Federal regulation prohibits the use of genetically modified seeds in organic farming (Organic Trade Association, 2014). Education and training are essential to promote and implement sustainable and efficient farming with organic cotton. The use of pesticides on organic farms is replaced with local botanicals to control infestations, promoting natural enemies to combat the infesting organisms (Page & Ritchie, 2009). Organic production is a safe and environmentally responsible alternative to conventional methods, providing long-term economic and environmental sustainability (Myers & Stolton, 1999).

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“Organic cotton growers rely on nutrient manipulation, water management, mechanical topping, and organic acid-base foliar sprays to assist in boll maturation, boll opening, plant desiccation, and leaf drop” (Myer & Stolton, 1999). Organic cotton farming uses natural fertilizers, conducts field preparation, and uses minimal to no chemicals (Solomon & Rabolt, 2004). “From an environmental standpoint, every pound of organic cotton means about one-third less pound of pesticides in the United States” (Wilson, 2004). Organic farming, “relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects” (Textileexchange.org, 2013). With the appropriate cottonseed being used, based on geographical and climatic factors, large and small-scale farms can implement sustainable production strategies eliminating the need for artificial supplementation of the environment (Page & Rithchi, 2009). This type of farming has been proven to be more resilient to climate extremes and in some cases produce an increase in lint yield (Textile Exchange, Cotton Briefing, 2011).

Crop rotation is one of the key differences between organic cotton farming and the monoculture system used with conventional methods. The crop rotating system protects soil diversity by replacing the nutrients, reduces weed populations, maintain adequate soil conditions (Myers & Stolton, 1999), and prevents pests from over-wintering (Page & Ritchie, 2009). Crops are rotated every three to four years. Growing several crops in close proximity at once through is called intercropping. Cover crops are grown during the off-seasons to manage the micronutrients and macronutrients that were depleted during the crop cycle (Myers & Stolton, 1999). Converting a crop to be organic takes a minimum of three years to allow the soil to neutralize (Hulm, 2008).

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Crop rotation protects biodiversity, as seen in Figure 7. The bars above the zero line represent that number of studies that showed organic cotton farms having positive effects on animals and plant varieties. The bar that falls below the zero represents the organic farms that had a negative effect on biodiversity. Overall, the results show that many more studies had a positive effect on environmental diversity (Truscott et al., 2013).

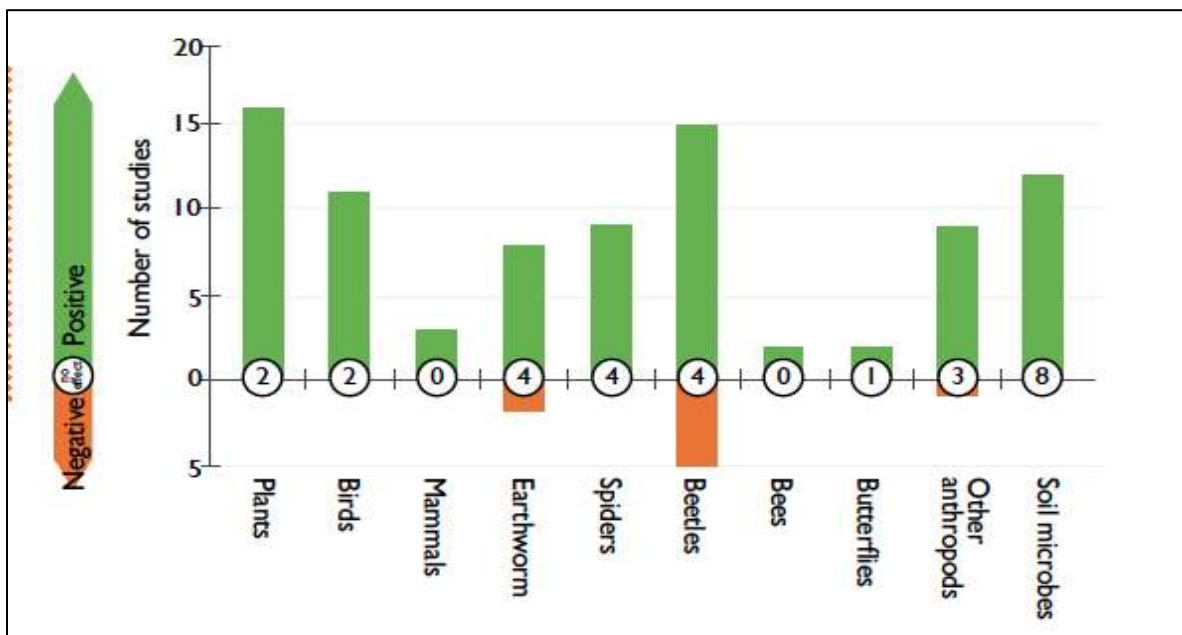


Figure 7. Organic farming impact on local biodiversity. Source: Truscott et al., 2013.

Additional steps can be taken to manage the soil nutrient levels. Introducing compost, rock phosphates, bacteria, and fungi to aid the decomposition and nutrition levels in the soil. Composts are combined with rock phosphates and both of these nutrient-rich materials combined together develop an acid that changes the phosphates into a soluble form. Azotobacter and Azospirillum bacteria are introduced to facilitate

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nitrogen fixation while Mycorrhizae and Bacillus Flavus assist with phosphorous absorption (Myers & Stolton, 1999). Organic soil retains 40-50% more water than conventional farming soil, which helps during dry conditions (Textile Exchange, Cotton Briefing, 2011; Textile Exchange, Creating Material Change, 2011).

Seventy to eighty percent of organic cotton is rain fed, while the remaining uses the efficient drip irrigation (Textile Exchange, Snap Shot, 2014) or alternative row irrigation that utilizes the surface water from local water irrigation district. Excessive watering can lead to an increase in the levels of plant growth, sacrificing boll development, and attracting lygus bugs and aphids, which can lead to a reduction in crop yields. An organic cotton harvest can produce more yields when the water supply is limited earlier in the growing season (Myers & Stolton, 1999).

Pest management strategies with organic cotton farming are used on an as-needed basis, focusing on monitoring, maintaining, and restoring natural balances. Clean weeding is not practiced in this method, because of the natural pest controlling organisms that the weeds attract (Myers & Stolton, 1999). This system has shown to be more effective with reduced pest populations identified in organic farming systems. Conventional farming methods have shown increased pest populations because the organisms that naturally control these pests are eliminated with the use of chemicals (Myers & Stolton, 1999).

There are many tools that can be used in the place of harmful chemicals that organic cotton production utilizes. Table 6, shows a list of the most prominent activities and tools that organic cotton farming uses. The disadvantages can be challenging, but in no way compare to the harmful destruction that conventional cotton production has.

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Tool	Advantages	Disadvantages
Use of botanicals	No or minimal financial cost, low toxicity for humans and the environment; no protective clothing needed	May not be effective for all pests. May kill natural enemies. FPR needed.
Conservation of natural enemies	Controls pests without pesticides; conserves natural habitats	Farmer training in conservation methods
Biological control of key pests	Controls pests without pesticides	Research and release programmes needed
Use of organic amendments	Low financial cost; increases SOM, conserves soil moisture	Increased labour requirement
Farmer training	Promotes knowledge sharing and skills development	Requires donor support
Formation of producer groups	Enables organic farmers to market cotton as a group and get a fairer price	Initial Government or Donor support until self-supporting
Field mapping* and record keeping	Enables inspectors to certify the cotton; ensures traceability	High cost of inspection, initial farmer training in record keeping
Premium paid to individual farmers*	Reduces risks associated with cotton production	Producer groups sufficiently organised to distribute premium fairly

Table 6. The advantages and disadvantages of organic cotton. The inputs under the tools column marked with an asterisk are specific to this best practice. Source: Page & Ritchie, 2009.

Organic cotton is picked and weeded by hand rather than conventional mechanized harvesting methods. Weeding organic cotton is done with mechanical cultivation and by hand hoeing as oppose to herbicides for conventional cotton. Hand picking reduces environmental waste, improves the cotton quality and creates local job opportunities (Myers & Stolton, 1999). Organic cotton has the challenge of minimizing leaf trash from incomplete defoliation, which can cause an increase in ginning and spinning costs. Alternatives used for organic defoliation are minimal, nutrient and water management is the best management approach (Gibbs et al., 2005). Farmers can use citric acid/clove oil, effective microbes, mineral application of specific zinc's or magnesium chloride, or use thermal defoliation, which is a tractor-pulled propane burner (Gibbs et

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al., 2005). These natural methods all need to be implemented and documented in order to meet the standards of organic certification in the industry.

3.35 Certification

For a garment to be sold as an organic cotton product, the entire production process must meet rigorous guidelines and be granted certification by an independent accredited third party (Textileexchange.org, 2013). These organizations certifying organic authenticity have succeeded in expanding the organic cotton market by establishing standards and building trust.

Obtaining the certification comes as an additional expense for the supplier, as seen in Table 7, but provides legal and brand protection. Certification provides transparency of the production process for the textile industry and consumer; also providing additional support to the supplier allowing access to new markets (Myers & Stolton, 1999; Robinson, 2003).

Country	Certification cost in relation to value of cotton
USA	1.30%
India	8.00%
Egypt	0.10%
Peru	0.50%
Uganda	4.30%

Table 7. Added cost of certification. These numbers represent the additional costs for obtaining organic certification for some of the countries that grow organic cotton. Source: Myers & Stolton, 1999.

The certification process is enacted and performed by different involved parties. Non-Governmental Organizations (NGO's), government agencies, and private companies provide certification after inspecting the production process in order to make sure they adhere to the organic standards (Myers & Stolton, 1999). Certified organic cotton labels

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are also granted by Fairtrade, MyBMP, Cotton made in Africa (CmiA), and the Cotton Program Manager (ABR).

There are many involved parties in the certifying business. Efforts are often made by very involved organizations like BCI, a non-profit organization, acting as a nexus between farmers and the industry, regulating and granting certification (BIMECO, 2014). Global Organic Textile Standard (GOTS) is another international working group that audits the organic cotton throughout the supply chain to protect ecology and the labor conditions (GlobalStandard.org, 2013). Additionally, independent companies, such as the Control Union and the Institute for Marketecology (IMO), are hired by retailers to audit the organic cotton production process (Illge & Preuss, 2012).

The Global Organic Textile Standard (GOTS) identifies and outlines the processes and procedures throughout the manufacturing of organic textiles; “From harvesting of the raw materials, through environmentally and socially responsible manufacturing up to labeling in order to provide a credible assurance to the end consumer” (Global Organic Standard, 2013). Global Organic Textile Standard’s audits factories through residue testing and by an on site compliance audit (Global Organic Standard, 2013). In order for an end cotton product to receive the GOTS organic label, it must be comprised of a minimum of 95% certified organic cotton fibers, whereas a product that is labeled “made with organic” only requires 70% certified organic fibers (Global Organic Standard, 2013). In 2009 more than 2000 textile companies participated in the organic cotton certification system outlined by GOTS, which has been credited to increasing the organic cotton production (Illge & Preuss, 2012; Organic Trade Association, 2014).

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During all stages of the manufacturing process, conventional and organic cotton must be kept separate, in order for organic cotton to be certified. These companies impose continuous oversight over the process in order to minimize the environmental impact from unnecessary waste. During wet processing records of waste levels, chemical, energy, and water usage are annotated and the wastewater is then treated prior to disposal. “Bleaches must be based on oxygen, Azo dyes that release carcinogenic amine compounds are prohibited, and the use of sizing agents is restricted: knitting and weaving oils must not contain heavy metals” (Global Organic Standard, 2013). The International Labour Organization (ILO) establishes guidelines for sustainable packaging practices, technical standards, and the criteria for personal safety standards (Global Organic Standard, 2013).

Farmers are faced with new challenges when implementing organic farming practices. Certified organic cotton standards exclude all samples that show positive GMO traces that frequently occur due to cross-pollination from surrounding cotton fields using genetically modified cottonseeds (Illge & Preuss, 2012). Farmers also face the additional expenses associated with organic certification (Myers & Stolton, 1999). Chemical concentrations in the soil also may prevent an immediate transition for farmers from conventional to organic certification. Even if a farm meets all standards needed to grow organic crops, government regulations may prevent them from doing so by banning certain organic seeds (Myers & Stolton, 1999). In Peru, the government exercises control over the dates of planting, harvesting, and water (Myers & Stolton, 1999). The transition from conventional to organic farming will initially provide short-term obstacles for farmers, but will provide a sustainable and profitable future for them.

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3.36 Social Impacts of Cotton Farming

Regions that implement organic farming practices stand to benefit monetarily in the long-term, but also experience an increase in quality of life and standards of living. Farmers develop relationships and gain access to continued education and training programs, women in the industry gain independence and reduced discrimination, and labor conditions are improved throughout the industry. Aside from the individuals directly involved in the organic farming process, the entire local community benefits from increased access to education and the additional revenue entering into the local economy. The transition from conventional to organic cotton farming will drastically improve the socio-economic conditions throughout the region.

3.361 Farmers

Conventional farmers are the most economically disadvantaged and have the least amount of leverage in the cotton supply chain (Truscott et al., 2013). Ten percent of fatalities in the agricultural industry are linked to pesticides (Myers & Stolton, 1999). Approximately 20,000 people die in developing countries a year from poisoning caused by chemical applications from agriculture (Ecologist, 2013). Laborers are frequently exposed to large volumes of chemicals that can lead to immediate health concerns such as poisoning, or more distant future health concerns such as cancer (Pesticide Action Network, 2014; Sathe & Crooke, 2010; Usher, et al., 2013). Warning labels, often ignored, on chemical packaging advise workers to wear boots, gloves, protective clothing, and a respirator to prevent exposure (Page & Ritchie, 2009). The hot and humid climate present in most cotton producing regions is one reason why most workers ignore these warnings to avoid the discomfort and risk of overheating. Lack of adequate

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equipment continually results in spills, poisoning and incorrect application as observed by the UN Food and Agriculture Organization (2014). Cotton farms are often underfunded, and if the workers wanted to wear the protective gear that is advised, they would have to pay for it separately, but cannot afford (EJF, 2007; Page & Ritchie, 2009).

Organic cotton farmers have access to training, education, technical support, and partnerships with organizations that protect the farmer and his property from the hardships and risks that are experienced by conventional farmers (Organic Cotton, 2013). Organic farmers having direct relationships with supplier's increases social capital and opportunities to areas that face limited economic means (Warrick, 2013; Illge & Preuss, 2012; Usher, et al., 2013). "Where we are seeing more established 'partnerships' we are also seeing sector leadership, innovation, shared investment in environmental or community projects, and support of local entrepreneurship" (Textileexchange.org, 2014). Benefits from knowledge intensification programs develop skills for growers that will improve yields and quality of the organic crop (Textileexchange.org, 2014). Small farms also create research, as the farmer generates new information for creating solutions. This information has aided in alternative farming aids and on-farm research is exchanged among the farming community (Myers & Stolton, 1999).

3.362 Women

Women working in the organic cotton industry have increased access to education and employment opportunities, less risk of being targeted for gender specific discriminatory practices, and improved working conditions than their conventional counterparts. The use of hazardous chemicals in conventional production and farming methods produces conditions that are detrimental to women during pregnancy (Usher, et

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al., 2013). Most job vacancies in the conventional cotton industry with the potential for hazardous chemical exposure are exclusively for men (Myers & Stolton, 1999). With the limitations for potential jobs in the industry, women are given lower wages and little opportunity for advancement (Myers & Stolton, 1999).

Companies such as Better Cotton Initiative (BCI), who provide access to resources and potential partnering organizations, require all parties to provide equal wages and opportunities to women (Usher, et al., 2013). The multi-investor structure of the organic cotton market also offers financing and property to women, that is an option that is rarely provided to women in the developing cotton producing regions (Usher, et al., 2013). As of 2012, 54,000 women have been trained in sustainable farming practices with the assistance of BCI (Better Cotton Initiative, Harvest Report, 2012). Transitioning to organic cotton farming helps reduce gender inequality, providing women with new opportunities, education, and empowerment.

Lack of government regulations in developing countries, and limited to no oversight from the end product industries, expose laborers to inequitable treatment (Better Cotton Initiative, 2012). As seen in Table 8 these are the countries where this practice has been reported (Department of Labor). According to the World Bank, forced, bonded, and child labor are common practices in these developing regions, and most laborers receive a wage below the established international poverty threshold (Usher, et al., 2013).

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Country	Child Labor	Forced Labor
Argentina	●	
Azerbaijan	●	
Benin	●	●
Brazil	●	
Burkina Faso	●	●
China	●	●
Egypt	●	
Kazakhstan	●	●
Kyrgyz Republic	●	
Mali	●	
Pakistan		●
Paraguay	●	
Tajikistan	●	●
Turkey	●	
Turkmenistan	●	●
Uzbekistan	●	●
Zambia	●	
India*	●	●

*Cottonseed (hybrid)

Table 8. Countries producing cotton with child and forced labor. Source: Gurney & Jurewicz.

The organic cotton industry follows international fair labor guidelines and provides oversight through continuous audits. The Better Cotton Initiative holds farmers accountable for their labor standards and companies are motivated to meet these standards in order to continue to have access to the organic market (Usher, et al., 2013). Reduced chemical usage improves working conditions and eliminates the potential for workers to get ill, or die, from toxic exposure. Protective suits are no longer needed, and the workers are able to work comfortably without the fear of exposure. Laborers working within the organic cotton market, as opposed to conventional markets, are provided a fair wage, a comfortable, healthy, and safe work environment, and the comfort of knowing they have long-term job security.

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3.363 Community

Aside from the lack of sustainability associated with conventional farming, the effects from conventional methods are detrimental to the regional environment.

Chemicals from pesticides are leached into the ground and seep into the groundwater (Better Cotton Initiative, Harvest Report, 2012; Myers & Stolton, 1999). The regions surrounding some conventional cotton farms have reported high rates of birth defects, infant mortality, and diseases from blood borne pathogens (Myers & Stolton, 1999).

Conventional cotton contaminates food by the multiple toxic chemicals entering the food chain through indirect and direct means. Research estimates that 65% of the cotton plant ends up in our food chain through cottonseed oil, used as a food preservative, or indirectly by livestock that ingests contaminated cotton stalks or water (EJF, 2007; Myers & Stolton, 1999; Ross, 2006). Conventional farming methods reduce biodiversity in the environment, negatively affect local food sources, and reduce the overall health and life quality in the community.

Conventional cotton farming not only contaminates the region's water, but also requires excessive amounts of water in order to harvest. The Aral Sea lost 60% of its volume due to the irrigation systems of conventional farms, which collect the water from rivers that feed into the Aral Sea (Myers & Stolton, 1999; World Wildlife Fund, The impact of cotton, 2000). Organic cotton farming aims to conserve the water through methods of education, innovation, and conservation that would otherwise be wasted with conventional. The Better Cotton Initiative educates cotton farmers in the selection of cottonseeds based on the climate, calculating the volume of water needed to adequately sustain the crop, and also provide farmers with equipment that increases efficiency and

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assists in water conservation (Better Cotton Initiative, Harvest Report, 2012). Organic cotton farming improves the quality of the water for the community, and increases the supply available to them through innovative and efficient conservation methods and equipment.

Sustainable practices associated with organic cotton farming are beneficial to the regional and adjacent communities. Crop rotation methods not only improve soil fertility, but also provide another crop that can be sold locally. An organic farmer can harvest vegetables in the off-season, which can provide additional food for the community and income for the farmer. Eighty percent of organic cotton farmers surveyed by Textile Exchange (2014) reported that they had food security. A farmer may also choose a crop to export for additional revenue, which is then circulated into the local economy (Organic cotton, 2013; Myers & Stolton, 1999). A region, over time, will have increased biodiversity with this holistic farming method, reducing pest infestations. The reduction of pesticides and fertilizers will increase the water quality in the region that is affected by chemical runoff, which will improve the health of the entire community (Organic Cotton, 2013).

By establishing new practices, education, and holding farmers accountable, organizations like BCI can have a positive influence that can benefit the community as a whole. The infrastructures and frameworks developed through education, training, and partnerships in organic farming improve the regional income levels, health, safety, and labor practices (Usher, et al., 2013). Fair wages, labor practices, and the development of skilled workers through training and education provide the farm with a long-term, reliable, and efficient group of skilled laborers (Usher, et al., 2013). Long-term benefits

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of organic cotton farming will increase the level of education, environment, and quality of life for the surrounding community. Companies who increase trade from the rural communities improve and invests in the socio-economic opportunities (Textileexchange.org, 2014).

3.4 Economic Conditions of Cotton Production

The following section explores the organic cotton production through an economic lense. The economics begin to differentiate between the two cottons at the production level and continue through the supply chain. The actual costs of production, not ignoring the hidden costs to the environment, will be addressed by identifying negative externalities. Then the text outlines the economic risks that can take place throughout different points in the supply chain and to the identified investors. Followed by a breakdown of organic cotton's cost and how the final price is determined at retail level.

3.41 Cotton as a Market Commodity

Understanding the future of the organic cotton market is best quantified and analyzed with economic discipline. Cotton is such a dominant agriculture crop that it is recognized globally as an export commodity (Textile Exchange, Cotton Briefing, 2011). The cotton market is affected by world economic conditions, weather, and political unstableness (Truscott et al., 2013). Market trends of conventional and organic cotton production influence the decisions and prices in the fashion industry. Capitalism and fashion inherently share the same consuming characteristics that support the continual act of buying (Claudio, 2007). This structure supports the continual growth of the fashion

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industry, and has contributed towards the three-hundred billion dollar (US dollars) cotton market (Sathe & Crooke, 2010).

3.42 Market Structure

The market structures between the two cottons are also different. Conventional cotton fiber is sold on the market against all other producers competing for buyers. The structure of the conventional cotton market is vulnerable to price volatility, and supply and demand can experience unforeseen dips and spikes due to factors like time that are unique to the agriculture and fashion industry. Organic cotton has a unique multi-partnership structure that reduces a middleman and has alternative purchasing method.

Conventional cotton garments maneuver through an integrated vertical supply chain, where the retailers increasingly hold buying power (Nordas, 2004). Figure 8, shows the visual representation of the conventional cotton market. Conventional garment prices are specified from the retailer and pushes the constraint backwards down the line of production (top down) unlike the organic alternative that finds the traditional method of establishing the final cost based on adding a profit margin to the established price of production (bottom up). Conventional cotton garments are designed first by a retailer, then orders identifying quality, price, and color are placed with a third party that produces the fabric to the standards specified (Myers & Stolton, 1999; Sen, 2008).

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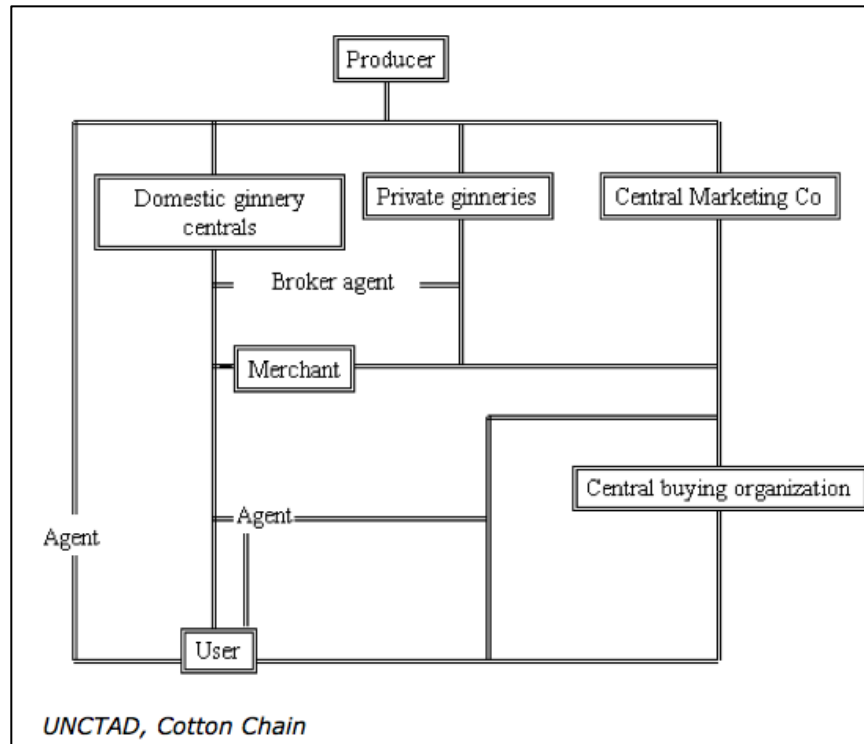


Figure 8. Conventional cotton market structure. Source: www.UNCTAD.com

The company choosing to dedicate their efforts towards a sustainable cotton alternative must start at the beginning of the supply chain with the farmers (Myers & Stolton, 1999). Relationships are established between supplier and producer with the assistance of organic cotton initiatives and NGO's. Organic cotton initiatives and non-profit organizations partner suppliers with producers for the mission of increasing organic cotton production. Retailers and farmers communicate and make decisions on what aspect will be sacrificed for the sake of cost, quantity, and will agree on the final price paid to the farmer for the fiber (Myers & Stolton, 1999). The organic cotton market benefits from its unusual structure of partnerships and the practice of future crop sales. "Longer-term, committed value chains can decouple their business from the market and

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base it on their own predicted business growth. Allowing all parties to plan and produce/buy accordingly” (Textile Exchange, Cotton Briefing, 2011).

Organic cotton initiatives vary in size but all are lending support and resources to further improvement. Smaller initiatives focus on countries such as, Cotton made in Africa, Bayer e³, and The Sustainable Cotton Project & Cleaner Cotton (Truscott et al, 2013). Larger organizations that play a role in the organic cotton market are CottonConnect, FiBL Research Institute of Organic Agriculture, HELVETAS Swiss Interoperation, and Agro Eco (Truscott et al., 2013). Growth in the organic cotton farming has seen a direct increase from these organizations, by means of reducing market risk and securing buyers. Better Cotton Initiative has reported continuous expansion, and even more so in the last couple of years. The Better Cotton Initiative Fast Track brands (BCFTP) procured 30,000 metric tons of cotton lint, 15% more than they had targeted for (Warrick, 2013).

3.43 Negative Externalities

Conventional cotton production partakes in environmentally harmful practices that are not reflected in the true cost of the finished product. These practices are known as negative externalities and result in problems for the community and society as a whole. A negative externality occurs when a business or organization makes a decision that they are not held accountable to pay for, and the cost to the community is greater than the cost to the consumer paying for it. If businesses were held accountable for costs associated with the environmental damage caused from production, garments made from organic cotton production methods would be less expensive than the conventionally produced counterparts.

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The reality of the textile industry is that businesses are not held accountable for their decisions, and negative externalities are not factored into the price of a garment (Myers & Stolton 1999). Corporations and businesses take advantage of the lack of accountability and oversight of environmentally harmful production methods to increase their profits. Environmental contamination from chemicals entering the water, food chain, and soil, increases the community's susceptibility to developing disease and various long-term health issues. Additionally erosion, the reduction of bio-diversity, and the introduction of synthetic fertilizers into the environment add to the rate of pollution and climate change, causing long-term irreparable damage.

“Organic cotton is better than traditional cotton for the health of natural systems, but the market incentives are not aligned with its long-term environmental benefits” (Sathe & Crooke, 2010). Domestic and international fiscal policy and regulatory oversight needs to be implemented and/or revised to hold the textile industry accountable for the environmental damages caused from production. Research has shown that once the textile industry is held accountable for the impact it causes on the environment and surrounding community, the garment developed with organic production methods costs significantly less for both the company and consumer (Myers & Stolton, 1999).

3.45 Costs of Inputs Comparison

It is not possible to say that one type of cotton is always more profitable to grow than the other, too many variables exist from crop to crop. Trying to compare the costs between cotton farming is best done within the same country and as close to proximity as possible, because the cost of inputs and varying climates (Myers & Stolton, 1999). In the case of cotton grown in Turkey the production cost of organic cotton is twenty times

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more than conventional. Half of that cost is from the farming production, 5% is accumulated through the supply chain covering logistical and certification costs, and the remaining is associated with the trader, segregation, ginning, warehouse costs, and inspections. Research has compared organic and conventional crops within the same country and found that fluctuating climate and cost of inputs make certain locations more profitable for organic cotton farming than others.

For the financial success of a cotton crop, the farmer needs to assess the external factors: scale of production, research support, quality and price of seeds, access to irrigation, access to timely inputs, longevity of season, production costs, financial details (like access to credit and time of payment), and the local ginning capacity (Page & Ritchie, 2009). Additional economic feasibility calculations should account for location, government regulations, subsidies, etc. The market price of cotton is distorted due to the industry being heavily subsidized and taxed. Subsidies like, diesel and water, vary by the type of good and amount depending on the country making it difficult to calculate price (Myers & Stolton, 1999).

3.441 Conventional Cotton

Large financial investments are required to start a farm that are profitable in the conventional cotton industry (Alweendo, 2008; Ikiara & Ndirangu, 2002; You & Chamberlin, 2004). An economy of scale is a necessity for profitability in these companies, which suppress emerging competition in the industry (Page & Ritchie, 2009). In developing countries the priority of farmers is the immediate income with little concern for long-term environmental destruction, which has contributed to the largely practiced conventional system. Rather than invest in alternative production methods,

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conventional cotton farmers resort to temporary, unsustainable, and environmentally damaging solutions to stay profitable, such as the use of plastic mulch (Myers & Stolton, 1999). Labor, electricity, fuel, fertilizer and other various chemicals are the resources being depleted with conventional cotton farming (Myers & Stolton, 1999; Winkle, 1978).

Chemicals used for conventional cotton makes up half the cost of production in most of the world (Myers & Stolton, 1999). In the USA, (cotton farms largely taking part in the states of California, Arizona, and Texas) cotton farmers are dependent on pesticides and are seeking ways of combating the rising cost (Myers & Stolton 1999). Brazil has faced a recent economic challenge with production because of the higher amounts of inputs needed to combat poor soil fertility (Page & Ritchie, 2009). Fertilizers and insecticides are applied to the crops at least 15 times during a year, representing 45% of the production costs (Page & Ritchie, 2009).

3.442 Organic Cotton

Organic cotton production costs can vary enormously. The inputs vary from conventional cotton farming. Organic agriculture does not have the large expense of chemicals and fertilizers although there is an additional cost of labor and certification. Organic cotton does not have to take out interest bearing loans for the initial investment of chemicals and fertilizers. Organic farming has much less expenses from the elimination of expensive synthetic fertilizer, pesticides, herbicides, and insecticides (Better Cotton Initiative, Harvest Report, 2012). In the organic production system the farmers save on the cost of fertilizers by using local resources such as compost and manure, but if those are not available buying organic fertilizer from another source can be more expensive and quickly negate the savings (Myers & Stolton, 1999; Organic Cotton, 2013). For example,

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organic fertilization in Egypt and Peru are more expensive and the crops are more prone to pests, making the organic crop less profitable some years within these two countries (Myers & Stolton, 1999).

Water and energy are significantly reduced in organic farming. The method of rain fed crops and drip irrigation systems reduce the excess use of water and save expenses. Completely rain fed crops eliminates the cost of irrigation installation and maintenance. By reducing fossil fuel dependency, organic cotton farming also can save up to 40% of energy expenses as oppose to conventional harvesting (Textile Exchange, Snap Shot, 2014). For example, in the United States organic cotton farming uses 16% less fossil fuels during the growing and harvesting process (Myers & Stolton, 1999).

Organic production has financial wins and losses. Organic cotton production may have a low overhead investment by the absence of chemicals, but certified organic cotton takes on the additional expense of certification and labor. Table 9, shows the premium price to yield output and how it affects the profit margin (Myers & Stolton, 1999).

Country/State	Cost price increase of organic production per unit of land	Yield decrease of organic per unit of land	Premium Price
India	-16%	14%	25%
Egypt	2%	7%	15%
Peru	11%	20%	18%
California	11%	12%	50%

Table 9. Organic cotton as it differs from conventional cotton production. Source:

Organic cotton crops have an added labor cost instead of the use of hazardous chemicals. The additional labor expense is accrued for tasks such as spot weeding, monitoring the soil, and watching for infestation and disease (Sathe & Crooke, 2010; Solomon & Robalt, 2004). Depending on the region the labor expenses vary. Turkey is a

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location that experiences such price competition in the cotton market, because it has a higher standard of living than a majority of other cotton producing countries. This can be exemplified in the organic cotton price due to the added labor needs (Textile Exchange, Turkey, 2013). Although, most research concludes that organic farming produces a steeper profit margin due to the price premium and the absence of chemical expenses, regardless of the added certification cost (Textile Exchange, Cotton Briefing, 2011).

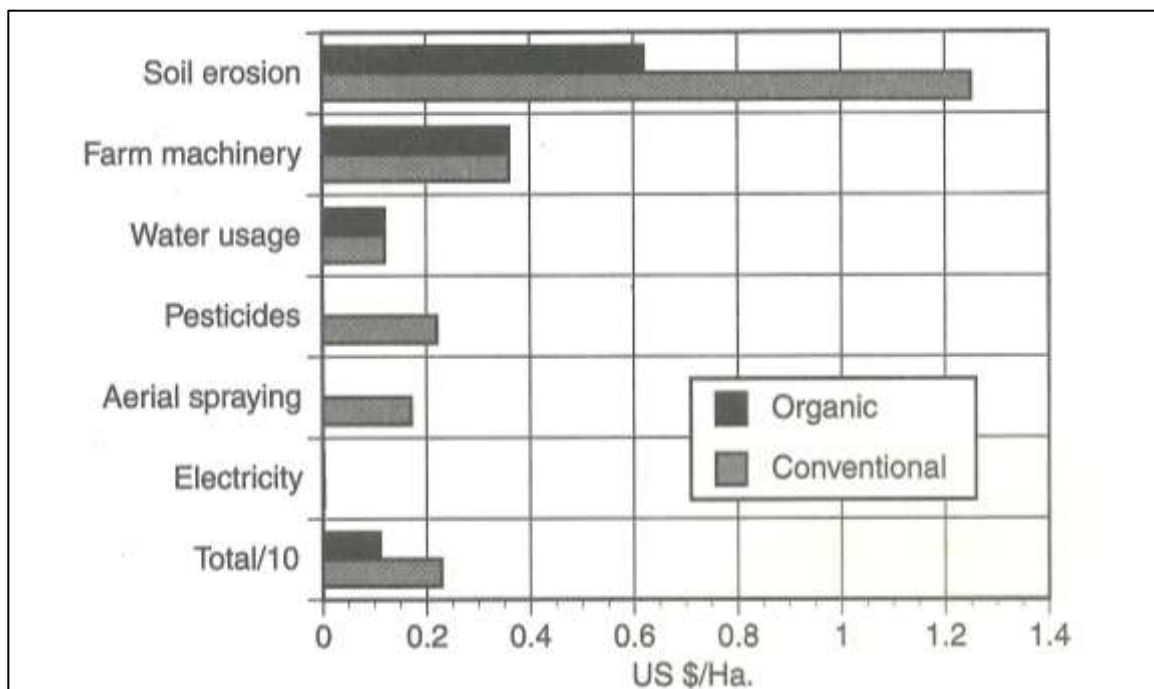


Figure 9. Input comparison in cotton production. The different inputs in farming cotton are compared between conventional farming methods and organic. Source: Myers and Stolton, 1999.

Organic cotton initiatives have been documenting the quantifiable differences between conventional and organic production. The Pre Organic Cotton (POC) program focused on the transitioning of cotton crops in India to be certifiably organic. During the process POC reduced agrochemical purchases by 73.3%, increased yields by 27.6%, and reduced over production costs by 36.2%. The health

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of farmers also improved significantly overall and reported a decrease in headaches, dizziness, and coughing with an overall improvement of skin and eyes (Pre Organic Cotton Program, 2014). In Mali, Pakistan, and India, BCI partnered with farmers to reduce water use by 20%, use 67% less pesticides, and reduced the use of commercial fertilizer by 33% all while reporting a 20% higher yield than control groups (Warrick, 2013).

Sixty farms in India grew organic and conventional cotton and reported conventional cotton yields were 14% higher, but organic production costs were 16% to 37% lower, depending on the area of India, and in the following years the organic yields increased (Myers & Stolton, 1999). Overall, the research has shown that organic production costs are lower, mature organic crops produce more yield, and therefore the predominant organic cotton producing countries have shown that organic is more profitable.

Conventional and organic cotton farming both share the same goals and challenges, they are managed in different ways. By the process of sustainable farming the elimination of all excess and chemicals saves the organic cotton farmers money, but the farms still have to fend off diseases, pests, and harvest the cotton. Organic cotton farming can reduce the production cost through better management practices and training (Sathe & Crooke, 2010). It is more financially beneficial long-term and protects against rising costs of chemicals and fuel.

3.45 Cost of Organic Cotton Production through the Supply Chain

The apparel supply chain is important because of the strategical importance that directly affects the success or failure of a company (Sen, 2008). Other additional costs

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accumulate during the production of organic cotton due to a multiplying effect where the increase cost is passed through production. Most the additional cost happens during the growing stage from certification and increase in labor. The multiplying effect in cost continues to accrue from the need to clean the ginning and weaving machines of conventional cotton, separate handling that is required and smaller runs (Myers & Stolton, 1999). Organic cotton does have the ability to reduce cost by enhancing the supply line through identifying potential problems before they occur by means of technology and the accompaniment of the distinct line of communication. “Designers becoming ecological and involved in the supply chain have access to experts to help make necessary changes upstream and further increase the commercial viability of organic cotton” (Myers & Stolton, 1999).

3.46 Economic Risk

Economic risk occurs throughout the cotton garment production process. All the involved parties face risk when interacting and conducting business at any point in the supply chain. Organic cotton and conventional cotton contribute different risks, but most of these liabilities that come with agriculture and business can be counteracted.

3.461 Risk to Farmers

Regardless of the chosen production method farmers will face the economic risk of global recession, fluctuations in foreign exchange rates, and increased costs along the supply chain. The market structure varies between the two types of cotton and degree of risk can increase or decrease with the size of crop. The market structure and the intimate size of the organic cotton market offer more economic stability and a secure future for the farmer.

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The conventional cotton farmer faces many risks regardless of the crop size. Although, small-scale conventional farming (the most prevalent size of crop) exercising monocropping creates an even higher risk, dependency, and vulnerability (Textile Exchange, Cotton Briefing, 2011). Conventional crops are planted, grown, and sold months later into a largely saturated market. Growth rate of a cotton crop can never compete with the volatile price that represents the stock price on the international stock exchange. The alarming case of 2009 is one example where cotton was trading \$57.05 (US dollar) per pound in August and by October it dropped 29%, cutting into the profit margin of production (Page & Ritchie, 2009).

Conventional cotton farmers work in a financially tumultuous situation that can create a large amount of debt with a single bad harvesting season. Conventional farmers will often take out loans leveraged against their property to finance the next harvest. They use this money to supplement their income and pay for supplies and labor until the end of the season, where they receive a lump sum payment that they use to pay off the loan (Page & Ritchie, 2009). If the harvest yields less than expected, or crops fail from environmental conditions (i.e. weather, infestation, disease) the farmer's future harvests will be used to pay off this debt and further reduce profits (Page & Ritchie, 2009). If multiple harvests fail consecutively, this creates a financial situation that is nearly impossible for the farmer to recover from, and he/she could possibly lose the farm that provides livelihood to him/her and his/her family. India has been dubbed the nickname "the suicide belt" referring to the average rate of one farmer committing suicide one in every eight hours from the inability to pay off his/her debts (Organic Trade Association, 2014). These debt cycles has led to an increase in suicide rates among conventional

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farming community, but there have been no suicide within the organic cotton community reported (Textile Exchange, Cotton Briefing, 2011).

The organic cotton market can be more desirable to a farmer than conventional cotton market due to the fact that it is artificially manipulated by subsidies and susceptible to fluctuations (Better Cotton Initiative, Harvest Report, 2013). Due to the small size of organic fiber production the market can be more secure, with an increase in demand, a low supply, and little competition to drive prices down; certain years can be very lucrative (Textile Exchange, Cotton Briefing, 2011). As it is, organic cotton farmers are not producing enough yield to fulfill demand (Hulm, 2008). Organic cotton producers are not in danger of entering an overly saturated market with weakened prices and are selling in a market that delivers more respect.

Organic cotton can also provide a higher revenue stream for the farmer due to an attached premium price. Farmer's growing organic cotton can receive up to 30% more for their crop depending on the country and buyer (Illge & Preuss, 2012; Organic Cotton, 2013). Small-scale organic cotton farmers have reported a more stable income than that of conventional farmers, which allowed them to provide health care, food security, and education (Truscott et al., 2013). Price premiums and the diversification of their crops reduce the financial risk to farmers (Page & Ritchie, 2009).

The organic cotton industry is set up in a way where the farmer and partner organizations share a mutual risk and responsibility for the cotton crop (TextileExchange.org, 2013). Organic cotton farmers have the luxury to pre-sell harvests at guaranteed prices, called forward selling, enabling farmers to plan scales of production confidently. Buyer's will assist with pre-financing, reducing the middleman, which

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increases the financial reward to the farmer and provides them with tools to grow a quality product (Textileexchange.org, 2013). This business model develops long-term relationships between farmers and companies or organizations they partner with, creating a stable and sustainable production model while reducing financial burdens and risks for all involved parties (Better Cotton Initiative, Overview of the Better Cotton, 2009).

3.462 Risk and the Supply Chain

The supply chain that connects farmers to retailers is sensitive to profit loss. Uniquely the conventional cotton market and retail industry work backwards. Retailers influence and manage the textile supply chain by establishing the desired cost of the finished garment, consequently leaving the producers to find profit through streamlining the production process and attain largest yields (Nordas, 2004). The challenge to the retail/fashion industry is the struggle between balancing business performance and flexibility with environmental consciousness and sustainability in another (Illge & Preuss, 2012).

To improve the management of the supply chain, organizations like the BCI analyze and monitor past and current sales between suppliers and buyers (Better Cotton Initiative, Harvest Report, 2012). An ideal model includes a holistic approach that integrates all involved parties planning and communicating openly to best meet demand and reduces risk (Truscott et al., 2013). Greater engagement, capacity building, and investment are needed to increase the efficiency and success of the supply chain (Truscott et al, 2013).

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3.463 Risk to the Retailer

Economic risk has hindered the organic cotton garment market's expansion. After a decade of production it is still significantly small. In 2008, five fashion retailers supported 57% the organic cotton market (Illge & Preuss, 2012). Potential investors are nervous because they see a lack of data as a lack of transparency (Illge & Preuss, 2012). Organic Cotton poses different risks to retailers. A smaller market creates risk because if a company fails to receive the amount of fiber ordered for garment construction it leaves little to no other production sources to buy from. Depending on the size of a company and structure of their supply chain the retailer's practice in acquiring organic cotton has to be part of a well thought out business strategy. To combat risk retailers can mitigate insecurity through smart business strategies, continual analysis of the market, and open communication with producers.

Retail companies can reduce risk by proactively taking part in sustainable practices before scrutiny or resource scarcity forces change. For example, the growing competition for land use is mitigated with crop rotation during organic cotton production (Truscott et al., 2013). "Due to the increasing scarcity of fossil fuels and fresh water, expanding population, and rising cost of farm inputs it is almost certain that within the next 5 to 10 years sustainable agricultural practices (i.e. using less energy, water, and agrichemicals: will provide more cost effective food and fiber" (Textile Exchange, Cotton Briefing, 2011).

The small amount of organic cotton being produced for the market increases the risk to the retailers if a region experiences a bad harvest. Patagonia Inc. has said they are not large enough to sustain the organic cotton market and they need more buyers out

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there to increase growers (Reinhardt e al., 2003); which will help minimize the risk and secure the market. Retailers should diversify the sources to mitigate the risk of the depended output. Since organic cotton is grown in over 22 countries and the farming plots are already small in size, a company should establish their producing sources through region diversification (Textile Exchange, Cotton Briefing, 2011).

The unique ability for the retailer to communicate with the producer is an organic cotton market advantage that reduces risk to the company. The organic market eliminates the middleman and implements the practice of securing price with the producer, which saves on cost (Textileexchange.org, 2014). This relationship between retailer and farmer creates security and confidence by working with producers at an early stage, retailers can communicate their requirements and requests directly and identify challenges sooner or before they arise (TextileExchange.org, 2014).

Investors and retail companies have found the lack of standardized certification and production information as an added risk. Organizations like the BCI and Textile Exchange continually publish research to provide industry information and BCI is developing a traceable system through documentation to accompany organic cotton as it travels through the supply chain (Organic Cotton, 2013). Standardization to organic certification has solidified in recent years due to the multiple organizations within the industry due organization consolidating and expectations being established.

The organic cotton market has continually improved its transparency and standardization of production. Increase in crop production and the geographical separation secure availability. Presently, retailers can now see less risk and more incentives to buy in the organic cotton market.

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3.47 Price and Organic Cotton Garments

The final price of an organic cotton garment is one of the most influential pieces of the market system; finding the optimum price will find the sweet spot that encourages the most purchases while simultaneously making the most profits. Consumers must find the price appealing and justifiable to continue investing in the product spurring further market growth.

Price is important to consumers and affects the sell-ability of the finished product. The retail price of a finished organic cotton garment is one of the most critical facets. Organic cotton can fetch a premium price of 10-50% more when commodities spike, but the average premium is around 10% (Textile Exchange, Snap Shot, 2014). The final organic cotton product costs about 5-10 percent more than conventional cotton, this percentage can change based on the thickness and size of a sweatshirt compared to the thinner smaller pair of underwear (Textile Exchange, Turkey, 2013). Currently the retail sector is selling finished organic cotton garments for an average of 10-20% higher than conventional cotton (Sathe & Crooke, 2010).

The retail cost is greatly influenced by the material used since it is responsible for two-thirds of the cost; Patagonia says that 80% of the total cost is raw material (Beard, 2008). Price also has the additional challenge of facing extreme competition between retailers, which causes prices to be continually pushed down (Illge & Preuss, 2012). This exemplifies the importance of productions costs as they continue through the supply chain onto the shelves competing with conventional cotton garments and where the decisions lye in the hands of consumers.

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Retail pricing of organic cotton must be strategically priced to compete and appeal to consumers while simultaneously profiting. Since organic cotton is a volatile crop and can be costly to produce and the retailer is faced with the challenge of adjusting the profit margin to the point where it will not dissuade the consumer from the purchase. A majority of consumers are willing to pay 5-10% more for eco-fashion (Chan & Wong, 2012; Myers & Stolton, 1999; Niinimaki, 2010). Companies have trended towards the strategy of taking a loss in the profit margin accompanied by adding a slight increase to the price tag, which was successfully done by Patagonia (Patagonia, 2006). As the market structure and sizes compare right now for organic cotton garments to become mainstream the price of cotton garments should be comparable (Myers & Stolton, 1999).

3.48 Growth Analysis of Organic Cotton Market

The organic cotton market has grown significantly since it was developed in the early 1990s. The outlook for organic cotton, as a niche market within the cotton production industry, is projected to grow within the otherwise stagnant market. “Organic cotton production has rebounded and provided hope for significant increases in organic production.” (Rafiq, 2012). The organic garments and textiles produced in the cotton market are insulated from global shocks to the economy due to its appeal to consumers that are loyal to these eco-friendly products. The eco-fashion apparel industry is projected to expand within the existing cotton market, due to increasing demand by consumers, and organic cotton production will increase in order for supply levels to meet the demand.

“Figures provided by the Organic Trade Association in the 2004 Manufacturing Survey show that the sale of organic cotton fiber grew by an estimated 22.7% over the previous year. The market experienced a remarkable amount of growth of 2,000%

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between the years 2001-2010” (Textile Exchange, A Year in Review, 2013). This growth in production has led to a growth in the organic cotton apparel and home textile industry, which increased by 35% in 2009 grossing an estimated 4.3 billion dollars (Casabona, 2010).

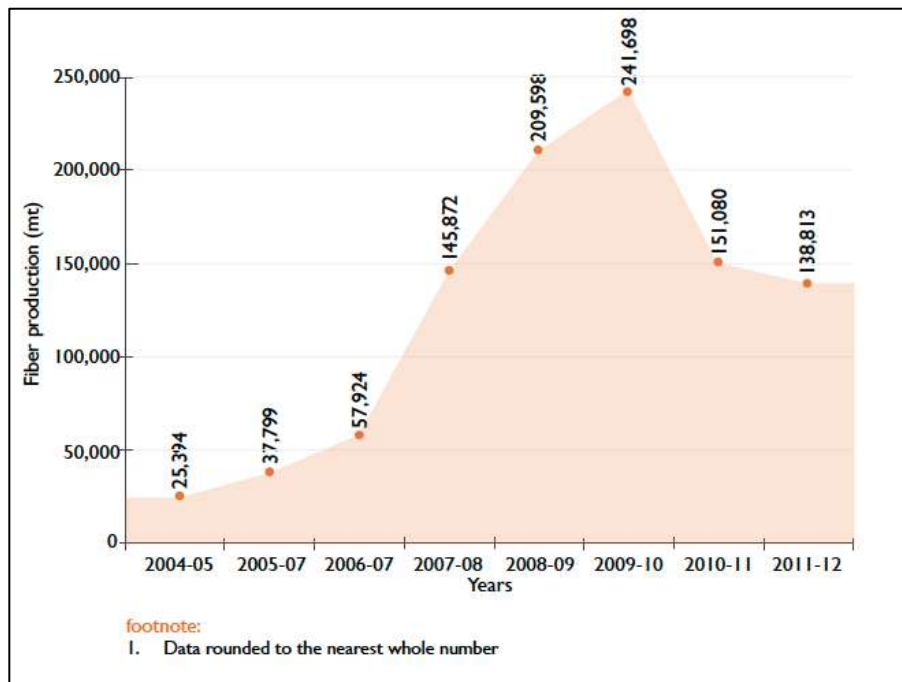


Figure 10 .The global production of organic cotton from 2004-2012. Source: Truscott et al., 2013.

The demand for organic cotton garments continues to grow as more consumers become aware of the environmental and social costs that occur throughout the supply chain. In 2004, women’s organic cotton clothing sales increased by 33% (Claudio, 2007). According to the Organic Cotton Exchange the market continues to show significant expansion, as seen in Figure 11. “Global retail sales of organic cotton products grew 83% in 2007 to US \$1.9 billion, and 63% in 2008 to US \$3.2 billion” (Sathe & Crooke, 2010). The increase in consumer demand for organic agricultural goods has been described as “particularly remarkable” by the Council of the European Union (2007). Currently the global eco-fashion industry makes up 1% of the apparel industry, but it is predicted to

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double over the next five to ten years (Lipson, 2008). The market increase is contributed to due increase in media coverage, companies' greater social commitments, and growing consumer awareness and environmental concerns (Lipson, 2008).

The increase in organic cotton production, and projected market growth, aligns with the forecasted market trends for the entire eco-fashion industry that is seen in Figure 11. Growing consumer interest has promoted the organic cotton market growth by a rate of 50% each year (Hulm, 2008). In 2009, the organic cotton apparel and textile industry reached \$4.9 billion dollars, a 35% increase from the prior year (Organic Trade Association, 2014).

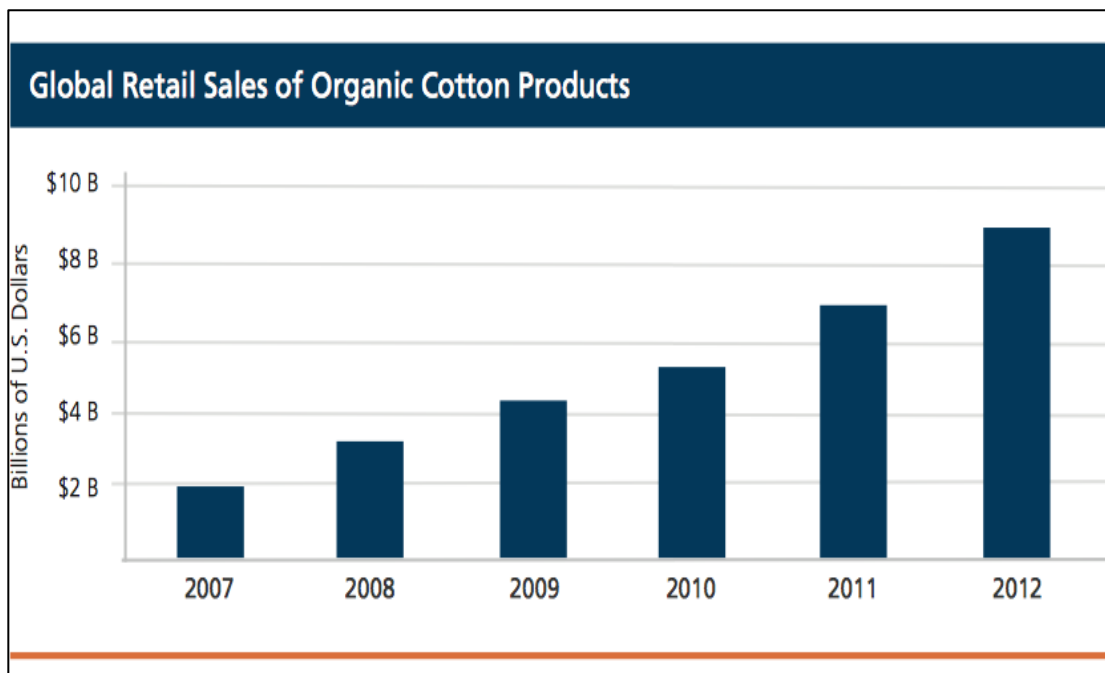


Figure 11. Global retail sales of organic cotton products. This graph encompasses all organic cotton product sales i.e. clothes and linens. Source: Textile Exchange, A Year in Review, 2013.

Figure 12 displays the global conventional cotton production levels. It was calculated by subtracting the organic cotton production (seen on Figure 10, provided by

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Truscott et al., 2013) from the total global cotton production data reported on the United Nations Food and Agriculture Organization (FAO) website. The remaining production data, less the organic cotton production numbers, reflects the conventional cotton production levels within the cotton industry.

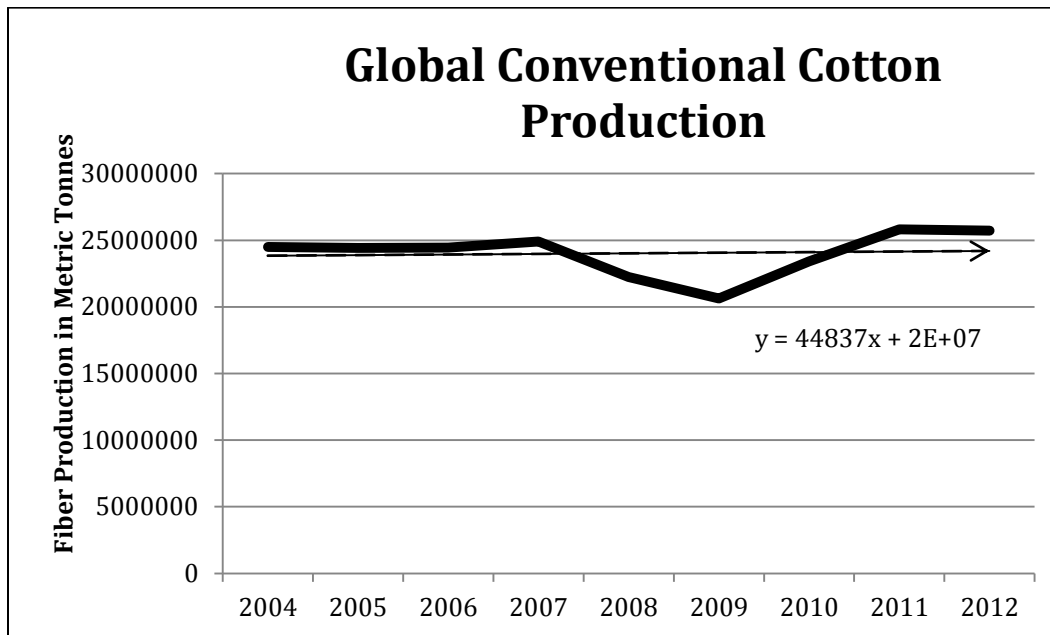


Figure 12. Global conventional cotton production. Data information from TextileExchange.org and FAO.org

A comparison organic cotton graph was constructed to compare, see Figure 13. A trend-line was added and the production output was adjusted to allow for a better visual comparison. Comparing trend lines and the industry's growth in the last decade shows that growth favors the organic industry. The trend line for organic cotton production is significantly steeper than convention.

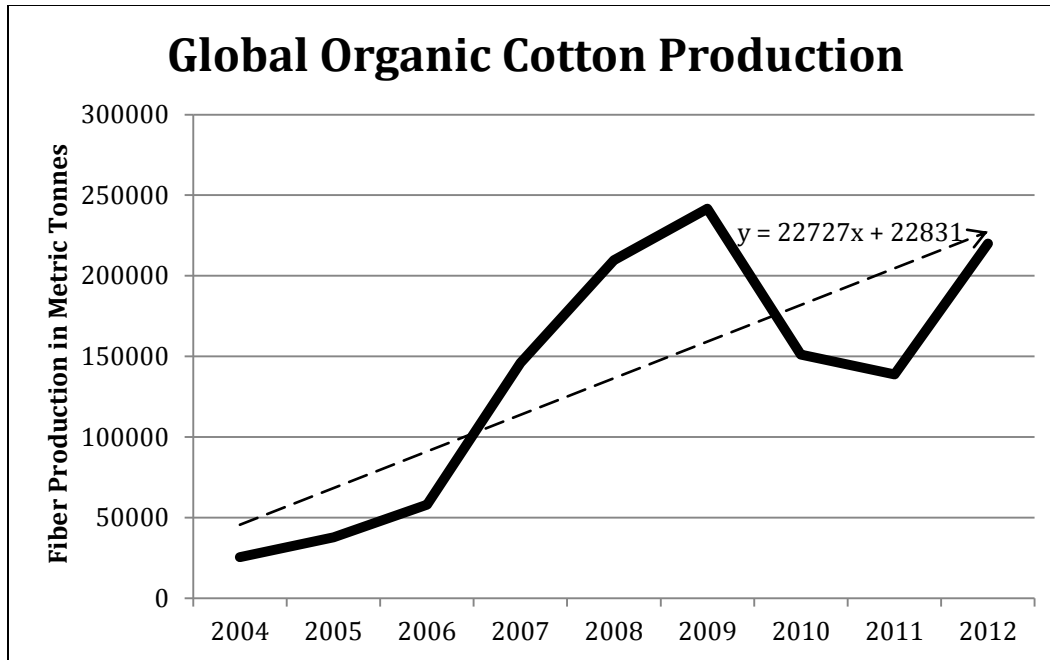


Figure 13. Global organic cotton production. Data information from TextileExchange.org

Figures 12 and 13 use market production data, which was analyzed over a ten-year period to show trends in production for conventional. The sharp decrease in production for conventional cotton during 2008-2009 was due to the global economic recession, which stifled consumer demand (Hudson et al., 2013). The fragile economies of the developing countries where cotton production occurred, was devastated in the communities relying on jobs in spinning mills, farms, and the other production sectors (Page & Ritchie, 2009). Competition from grains, oilseed crops, and fluctuating exchange rates in cotton exporting countries also contributed to the reduction in conventional cotton production (Page & Ritchie, 2009).

The volume of conventional cotton production recovered in 2010 and cotton farmers reemerged in the market at exponential rates due to the rising cost of cotton demanded on the international market. “This surge in cotton prices was a result of relative low cotton supply (approx. 22.3 million tons in 2009/10) after weak demand

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following the Great Recession and a strong increase of demand (approx. 25.5 million tons) due to an upswing of global growth stimulated by expansionary fiscal and monetary policy measures around the world” (Schindler, 2013). The price of cotton reached record highs in the 2010-2011 and 2011-2012 growing seasons (Truscott et al., 2013).

The graph in Figure 14 shows future trends in the cotton market consisting of a slight decrease in cotton prices over the next year, followed by relatively stagnant levels in consumption, production, and cotton prices over the next five years. This market prediction reflects the same conclusion as others, who claim a lack of technological advancements in cotton production as the causing factor of stagnation (Hudson et al., 2012; Rafiq, 2011). This conventional cotton market will experience a slight growth but the stagnant, and possibly negative, trend line is due to the production growth not rising at the same level as global GDP is predicted to rise due to inflation.

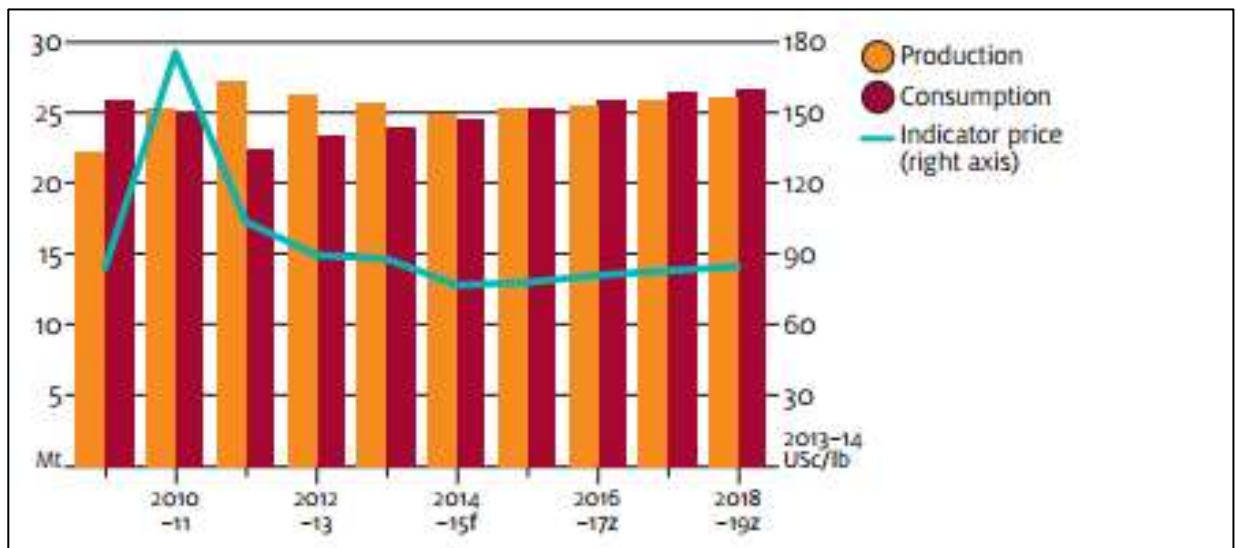


Figure 14. World cotton indicators. Cotton production and consumption comparison from 2009 to 2014 with future projections to the year 2018. Source: Agbenyegah, 2014.

“In 2012/13, global cotton production is estimated down by 5% from 27.4 million tons to 26 million tons and projected to drop another 9% to 24 million tons in 2013/14”

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(ICAC, 2013). Future projections estimate a growth rate of 2.8% from present till 2022, which is below the 3.7% growth rate experienced from 1995 till 2008 (Hudson et al., 2012). Productivity levels of conventionally harvested cotton are also projected to decrease from 2012 to 2023, growing by 0.5% per year, which “is lower than the long-term average yield gain of 1.43%” (Hudson et al., 2012). For the next few years the projected outlook of conventional cotton is overall stagnant due to a weaker global economy and developed countries narrowing their output gaps and deficits. For the next few years, countries are expected to reduce their excess cotton stocks and consumption is projected to remain constant. Overall, conventional cotton production has plateaued and faces the future economic challenges with vanishing resources. Companies potentially face a disastrous future if they continue to capitalize on primarily conventionally produced cotton products (Hudson, et al., 2012).

Figure 12 shows higher trends of growth in productivity within the organic cotton market than what is seen in total cotton production growth trends. This has resulted in an increased level of total global cotton production consisting of organically harvested crops. Organic cotton production increased by 20% in the 2007-2008 growing season, but experienced a significant drop in production the following year. The drop in cotton production occurred due to the decrease in production in India, which “reduced seed availability and, importantly, increased regulatory systems such as the TraceNet, implemented by the Government of India” (https://www.icac.org/wp-content/uploads/2012/08/review_june_2011.pdf). India is the largest producer of organic cotton, and increased regulatory conditions in the organic market, as well as climatic conditions causing crop failures created this anomaly. The difference was a

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result from extreme weather from hail to droughts (Organic Trade Association, 2014).

Organic cotton production has rebounded since then and has consistently shown significant growth levels above the levels seen in the total global cotton production market.

Diminishing production levels in conventional cotton is shifting consumer demand towards other alternative products, and organic cotton needs to be promoted as the most responsible and ideal replacement. Countries in West Africa doubled their production levels of organic cotton production in 2007-2008 “as a result of the strong demand for organic cotton at the world level... the purchase price is interesting for producers (around 30% higher than that of traditional cotton)” (Agritrade, 2008).

This research indicates that organic cotton is an emerging niche product within the eco-fashion industry and significant growth is needed to reduce the large drops in production levels like the one that occurred in 2009. As global organic cotton production levels increase to meet the increasing levels of consumer demand the market volatility of the product will decrease.

3.5 Consumer Behavior

Consumer behavior is influenced by multiple influential factors that provide a difficult and complex approach to identify. Diverse personalities, motivational factors, demographics, personal accountability and other internal and external factors need to be explored in order to research what drives a consumer to specific purchasing decisions. In an attempt to understand what drives a consumer decision-making, I compiled data from previous research in order to identify trends and commonalities that exist within the existing research. This comprehensive analysis provides an interdisciplinary approach

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that can provide further insight into the influential factors that drive consumer retail garment purchasing decisions.

The increasing amount of research about what motivates consumer-purchasing decisions can provide areas of focus and increase the efficiency of marketing strategies for the retail garment industry in order to maximize sales. “The question remains whether green-thinking consumers ... will embrace apparel consumption patterns that limit or reduce the pace of fashion change or adopt other purchase preferences that put less strain on the environment” (Kim & Damhorst, 1998). Eco-fashion companies need to adjust marketing strategies to target the areas of focus that are identified in the research regarding consumer purchasing behaviors.

3.51 Why We Consume Fashion

“Fashion merges us with our emotional needs; it expresses our inner individual personality by external marks and symbols, brands and status items” (Niimimaki, 2010). Personal fulfillment influences fashion purchases and shopping itself can act as a way for individuals to actively participate within society while acquiring tangible items that shape individual identities and their perceived lifestyles. This need to create an individual “brand” through garment purchases propels consumers to shop for clothing based on current trends, designs, and styles, rather than necessity. Previous research has shown that consumers make purchase decisions based on a need to express their identity, rather than necessity, which is what retail companies in the fast-fashion industry capitalize on when producing garments. These companies are producing low priced low quality disposable garments for individuals that want to stay fashionable and up to date on the current trends and styles (Niinimaki, 2010).

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“Consumption includes two kinds of function(s) when answering to a person’s needs, targets and values: the consumer can try to achieve individual or collective benefits by consuming” (Niinimaki, 2010). Ethical purchasing decisions are made with others in mind, while individual purchasing decisions reflect a buyers own personal desires. Ethical purchasing decisions are selfless, while individual purchasing decisions are selfish. There is a significant amount of research that focuses on consumer purchasing behaviors, and this paper attempts to identify the specific influential factors that drive eco-conscious consuming (Niinimaki, 2010).

3.52 History of Fashion Consumption

Prior to World War I garments were elaborately constructed and custom designed for the individual (Strasser, 1999). These garments were worn for years, repaired when needed, and passed down to other family members. Once an article of clothing was worn out it would be recycled into quilts or used as rags (Strasser, 1999). During the war available resources became limited, which influenced clothing companies to change production strategies. These changes focused on reducing wasted resources, streamlining finished garments by reducing sizes, and providing a more uniform non-customizable clothing standard (Strasser, 1999).

This shift reduced the costs of production for clothing companies through technological and methodological advances such as improved technological efficiencies, out-sourcing, and increased levels of management over the textile industry (Nordas, 2004; Strasser, 1999). These changes to the garment industry were initially made to support the country during war, but this shift in the industry also altered individual consumer concepts about their clothing choices, as well as the current trends, styles,

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prices, and quality of clothing. Clothing changed from an heirloom quality item that consumers would make last, to disposable items that need to be updated with current trends and styles (Morgan & Birtwistle, 2009).

3.53 Current Fashion Consumption Trend

The fast-fashion industry emerged in the garment industry from the development of low priced low quality disposable clothing. The emergence of the fast-fashion clothing industry model is responsible for increasing levels of resource consumption, waste disposal, and environmental degradation. Developed wealthy western nations have embraced the irresponsible practices associated with the fast-fashion industry in order to keep up with current trends, so consumers can stay fashionable without breaking the bank.

Fast-fashion is a newly emerging market within the ready-to-wear industry, producing trendy clothing at very affordable prices (Claudio, 2007). These fashions can be designed, produced, and placed on the retail floor within as little as two weeks (Morgan & Birtwistle, 2009). The fast-fashion industry is profitable due to the high levels of sales on low priced bulk production garments, which reduce costs by outsourcing production to developing countries, and the reliance companies have on consumer behavioral trends showing consistent impulsive purchasing decisions (Illge & Preuss, 2012; Morgan & Birtwistle, 2009).

“Girls especially are insatiable when it comes to fashion. They have to have the latest thing, always. And since it is cheap, you buy more of it. ‘Our closets are full’ Mayra Diaz a mother of a ten year old girl living in New York” stated (Claudio, 2007). These affordable must-have trends that change with each season promote an

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inconsequential and irresponsible disposable attitude for consumers who throw out last season's clothing to make room for their new stylish garments (Claudio, 2007). This "cheap-chic" fashion model appeals to teenagers by allowing them to continually wear something new and trendy (Mintel, 2007; Keynote, 2008).

In 2006, Oakdene Hollins published the report "Recycling of Low Grade Clothing Waste," that addressed the increase in the national wardrobe sizes (Claudio, 2007). The fast-fashion industry makes up one-fifth of the garment market in the United Kingdom (Morgan & Birtwistle, 2009). The increased wardrobe sizes are a product of the materialistic overconsumption mentality that has emerged in developed wealthy nations. More fabric is needed to produce these plus sized garments that are thrown out at the end of the season increasing the total volume of garments that eventually end up in the solid waste stream (Claudio, 2007). In the United Kingdom more than 1,000,000,000 kg of textiles are sent to the landfill each year. According to the EPA Office of Solid Waste, Americans, on average, dispose of sixty-eight pounds of clothing annually per person, making up 5% of the municipal solid waste which, collectively, adds up to 8 billion pounds per year (Claudio, 2007; Solomon & Rabolt, 2004). A study conducted by the Environmental Committee, found that the global volume of discarded textile waste has increased from 7% to 30% in the last five years (Poulter, 2008; Shields, 2008).

The fashion industry promotes the production of new inevitably soon to be obsolete articles of clothing that end up in landfills once the next season beings (Kim & Damhorst, 1998). "Being fashionable and being environmentally concerned appear to be in direct conflict" (Solomon & Rabolt, 2004). This increasing amount of production and consumption is alarming, and is one of many reasons that sales and marketing need to

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increase for organically produced cotton garments. The fashion industry needs to transition out of the disposable fast-fashion market, which is something that needs to be emphasized at fundamental consumer behavioral levels. Sustainable farming practices also need to be implemented and promoted in order to dampen the environmental impact from the fast-fashion industry, while still encouraging fashion companies to be environmentally and ecologically responsible.

As society evolves fashion reflects the values and social movements (Bauman, 1996). The fashion industry is a vehicle of social regulation and social pressure (Beard, 2008). The eco-fashion industry emerged in the 1990s during the green movement which focused on environmentally responsible practices that introduced consumers to new organically produced cotton garments. This environmental consumerism is attributed to social movements that promote individual responsibility and awareness (Kim & Damhorst, 1998; Lin, 2010).

The expression of an individual identity through clothing styles and designs has provided an outlet for environmentally and ecologically motivated consumers to promote their individuality, sustainable lifestyle decisions, and ethical responsibility through garment purchases. Ethical clothing purchases are made by consumers by weighing two internal values. These two internal values are ‘me’, which “works as a guide to environmental concerns and the ‘I’ addresses needs for vanity, beauty and newness...Therefore, the change in clothing, styles, and fashion is unavoidable, and manufacturers and effective marketing systems maintain this change process in contemporary society...the main driver for change is the consumers’ desires, not guilt” (Niinimaki, 2010). Since society is what drives industry changes, consumer behavior

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within the society is what needs to be focused on in order to initiate change within the fashion industry. Rather than focusing on consumer guilt in order to coerce them to make responsible eco-fashion purchasing decisions, organic cotton companies need to develop clothing and brands that are desired by the consumer. A shift in consumer demand to environmentally friendly products will force the industry to change in order to meet their needs.

3.54 Consumer Influences

Individual personalities and consumer demographics provide diverse and complex populations that make purchasing decisions based on multiple internal and external influential factors. The compilation of data analyzed in this paper focuses on research collected from developed wealthy nations where environmental responsibility is increasing for consumers. Demographics including nationality, religion, culture, geographical location, age, and ethics are some of the factors that alter the level of importance for issues that may guide a purchasing decision. “Germans value ‘taste’ and ‘quality’ more highly, whereas British consumers see ‘healthiness’ and ‘not genetically modified’ as the main characteristics” (said by Ochoa, 2011) for the main reason guiding their purchasing decisions.

“Clothing and fashion consumption converge strongly with construction of self and one’s own individuality, in order to express deeply one’s own personality, such as ethical values and aesthetic preference” (Niimimaki, 2010). Eco-fashion consumerism studies provide conflicting data, which can be partially explained by where the study was conducted, the demographics of the sample population, and consumer individuality. Comprehensive broad market analysis, as well as targeted consumer behavioral analysis

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both need to be conducted in order to identify both related and conflicting influential trends and factors that guide consumer-purchasing behaviors. This multilateral interdisciplinary approach helps predict and manipulate the future trends within the garment industry. Understanding what drives consumer behavior will assist in increasing the span, in both production and size, of the organic cotton market.

3.541 Internal Influences

This study identifies internal influential factors that guide consumer-purchasing decisions as key demographics for specific identifiable personality types. Behavioral disorders, such as compulsive and addictive shopping habits, are considered as anomalies that are removed from the research as outliers that would alter trends and relationships within the population. Understanding and identifying different personality types provides a way to observe, compartmentalize, and quantify consumers within the market in order to analyze data.

3.5411 Committed Consumer

Consumers making garment purchases seldom consider the environmental responsibility and ethical standards due to the lack of transparency in the industry and a compartmentalized and disconnected supply chain (Chan, 2012). Consumers purchasing the garment at the retail store usually do not consider the production of the garment, and do not see the environmental impact of this production, because this occurs in distant poor developing regions (Butler & Francis, 1997). This out of site out of mind mentality does not reflect that of the committed consumer, or ‘ethical hardliner.’ The committed consumer represents a small percentage of consumers who are willing to prioritize ethical responsibilities over aesthetics when making their purchasing decisions (Niinimaki, 2010;

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Myers & Stolton, 1999). This eco-conscious group makes up an estimated 5-10% of all consumers, but there are “increasingly more consumers are looking for various green products in the market” (Lin, 2010).

Someone who makes a purchase based on ethics is considered an ethical commitment consumer. Some of these people make purchasing decisions based on environmental responsibility, but individual ethics do not always equate to environmental responsibility. Ethics based purchasing decisions may be dictated by social responsibility, religious values, or other individual causes. Environmental responsibility is becoming an increasingly important influential factor in consumer purchasing decisions. The “Wall Street Journal” reported that 8 out of 10 consumers surveyed considered themselves environmentalists, and 10-15% of consumers identified as living “a fully committed green lifestyle,” which is above previously reported levels over the past ten years (Hanas, 2007; Ottman & Martin, 2009). Individual studies from both Connolly (2008) and Haanpaa (2007) came to the same conclusion that green purchasing decisions were influenced by individual personality types and contextual factors which all related back to individual associated identities. A green consumer lives a different lifestyle and purchases in a responsible and self-aware way (Moisander & Pesonen, 2002).

Individuals identifying themselves as environmentalists, in theory, would not contribute to the fast-fashion industry because the environmentally irresponsible behavior promoted by the fast-fashion industry would contradict the fundamental ideals of the environmentalist (Solomon & Ranbolt, 2004). Consumer behavioral surveys regarding environmentally responsible and ethical purchasing decisions do not necessarily reflect

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the true influencing factors of consumer behavior within the garment industry. When faced with questions about ethics and environmental responsibility guiding consumer purchasing decisions, consumers often lie about what truly guides their decisions. It requires a significant level of honesty, awareness, and willingness to accept responsibility for someone to admit, even when it is anonymous, that they make purchases based on factors such as price and convenience over ethical and environmental responsibility. Increasingly consumers are voicing their concern with the “ethical impact” of their garment’s production yet still continually support the trend setting fast-fashion companies that support cheap disposable practices (Beard, 2008).

The Pesticide Action Network (PAN) reported that consumers made purchasing decisions most often based on ethical production standards, followed by product quality, and least often based on environmentally responsible practices (Ochoa, 2011). Research has shown that ethics is often not a significant influential factor for consumers (Joergens, 2006). Studies have shown that consumers are often not willing to compromise convenience for ethics when making a purchasing decision (Carrigan & Attala, 2001). Consumption levels and research has shown that consumers will make ethical purchasing decisions if there is no added cost to price, quality, or conveniences (Carrigan & Attalla, 2001; Joergens, 2006).

3.5412 Health Conscious Consumer

The health conscious consumer is another group that has shown interest and willingness to purchase organic cotton garments. Consumers that are focused on living healthy lifestyles often seek out organically produced items including food and clothing (Lin, 2010). This demographic is drawn to products that limit their exposure to

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potentially harmful chemicals, including the pesticides and chemicals used in conventional cotton production.

The health conscious consumer bases their purchasing decision on what product is least harmful to their health regardless of the price, quality, or other external influential factor (Myers & Stolton, 1999). These people are aware of the negative environmental impact from the production of garments, and are willing to pay more for organically produced items, not because they reduce pollution, but because the product is less likely to negatively affect their health (Conscience, 2013; Lin, 2010). Often health conscious consumers are also environmentally responsible consumers who are motivated to make eco-fashion purchases to reduce their risks of health problems as well as protecting the environment (Niinimaki, 2010; Yan et al., 2012). Increased transparency in garment production is extremely important in order to provide awareness to these potential customers. Once a health conscious consumer is aware of the possible negative health risks, they become loyal organic cotton users that are not detracted by price premiums.

“Consumers in the food sector show more commitment in ethical consumption since food directly affects consumer health and their choice reflects a benefit to them” (Chan & Wong, 2012). A study by Levi’s Corporation found that consumers who purchase organic food understand what organic labels signify, and that purchasing organically produced garments reduces environmental pollutants that harm the environment and impact their food supplies (Ross, 2006). “As consumers are aware of what’s going on in the food industry, it transfers over to us” (Wilson, 2004). “The degree

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of organic food consumption of the responders is directly proportional to the aspirations of enhancing their quality of life and the desire to purchase clothing free of pesticides” (Ochoa, 2011).

Health conscious consumers are often willing to pay more for organic cotton garments once they are aware of the environmental impact that non-organically produced clothing has on the environment (Casadesus-Masanell et. al, 2009). The qualitative analysis, by Joergens in 2006, concluded that consumers who placed a significant level of importance on purchasing organic food did so because the reduced risk of health problems from chemical additives. These consumers did not initially consider or identify any direct health benefits from purchasing organically produced garments. Transparency and awareness needs to be emphasized in order to change the mindset of consumers when purchasing clothing (Petit, 2007). Ochoa (2011) found that women between 20-25 years old who purchased small to medium quantities of organic food displayed a higher than average willingness to also purchase organic cotton clothing.

Organic cotton clothing companies may have greater success target marketing strategies to appeal to the health conscious consumer in order to increase consumer demand. There is a significant amount of consumers within this demographic that currently do not make eco-fashion purchases, simply because they have not considered any health risks or benefits when purchasing clothing. The committed consumer is the demographic that currently is responsible for the majority of organic cotton sales, and targeted marketing towards them would not provide high levels of growth within the industry. Marketing strategies focusing on supply chain transparency, consumer

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education, and health could drastically expand the customer base and demand for the organic cotton market.

3.5413 Sympathetic Consumer & Casual Consumer

The sympathetic consumer and casual consumer are the two groups that are least likely to purchase organic cotton garments. The sympathetic consumer may purchase an eco-fashion garment based on a concern for the environment, but the casual consumer will not make a purchasing decision based solely on environmental concerns (Myers & Stolton, 1999). Out of these two groups the casual consumer provides the largest demographic that can potentially be targeted in order to increase organic cotton sales. These customers are influenced by clothing attributes such as price, quality, design appeal, fit, and comfort. As stated earlier in this paper consumers have been shown to be motivated by desires more than they are by guilt, and rather than organic cotton companies appealing to environmental issues, they can alter their product to meet the desires of the casual customer. Creating a high quality product that is trendy, well-tailored, and reasonably priced is the way to attract potential customers within this market (Myers & Stolton, 1999).

3.5414 Demographic Factors

Demographics have been identified and their relationship with consumer behavior have been thoroughly researched and written about. The main demographics that are observed are geographical location, education level, gender, and income levels. Age and gender have been consistently identified as the most significant demographics relating to consumer purchasing decisions. Race is often studied as another demographic important

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to consumer purchasing behavior, but research has consistently shown no empirical evidence that supports racial factors relating to consumer purchasing decisions.

Consumer shopping behaviors that have been observed have shown different influential factors based on their gender. Research has shown that women make purchasing decisions based on environmental and social responsibility, and are willing to spend more money on these eco-fashion products (Laroche, Bergeron, & Barbaro-Forleo, 2001). Women have expressed concerns regarding environmental conservation when making their eco-fashion purchases (Wilson, 2004). This finding is encouraging for predicting trends in the organic cotton market since the majority of consumers in the garment industry consist of women.

The largest demographic group of consumers of fast-fashion garments is made up of the youth population. High school aged consumers place a high level of importance on up to date fashion trends which make them the target demographic for the fast fashion industry (Martin & Bush, 2000). A study conducted by Butler and Francis identified less environmental concerns influencing eco-fashion purchasing decisions in older consumers than younger participants in the study. Consumer age is important in order to identify marketing strategies, locations, and projected success levels. Consumer behavior in eco-fashion purchases seems to be of little concern to younger consumers that are more focused on trendiness, but this level shifts once these consumers reach college ages. At this point consumers show the highest level of environmental activism, awareness, and responsibility which influences their eco-fashion purchases. These influential factors become less significant with increased ages of survey participants.

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The Generation Y college students indicated a high level of social awareness in a study conducted by Alloy Media and Marketing in 2006. A conflicting study conducted by Yan, Hyllegard, and Blaesi in 2012 reported lower environmental responsibility influencing clothing purchases among college aged participants. The conflicting data is most likely a result of geographical or cultural differences, income levels, or other demographic disparities. Garlick and Langley (2001) reported that young adults were willing to pay a premium for eco-fashion products, which was contrary to the results reported in a different study conducted 3 years later (Cone Inc., 2006; D'Souza, 2004; Hanas, 2007). The lack of consistency among the data provides insight into the differences in the level of influence certain factors have based on demographics.

Income level has not shown to be a demographic that influences consumer-purchasing decisions. The only significant finding regarding income and consumer purchasing decisions in eco-fashion was reported by, Cone & Roper in a consumer behavior report released in 2002. The findings in the report identified a significant level of importance placed on social responsibility influencing purchasing decisions for consumers that were working women, white-collar employees, and affluent consumers (Solomon & Rabolt, 2004).

3.542 External Influences

Tangible and intangible qualities of a garment such as “packaging, color, price, quality, brand, even service level and reputation of the seller” (as said by Chen & Wei, 2012) are some of the external influencing factors for consumers purchasing eco-fashion products. An organic cotton garment provides tangible attributes such as comfort and

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health as well as intangible satisfaction the consumer gets from supporting environmental conservation efforts (Chen & Wei, 2012).

The main external influencing factors can be categorized as store related attributes, garment related attributes, and environmental attributes (Chan and Wong, 2010). Factors identified in related research that influence consumer purchasing behaviors, such as convenience, marketing, brand reputation, and design, can be organized into their respective categories identified by Chan and Wong. Being able to normalize and categorize these factors provides a template that can be used in order to measure and analyze data from separate studies in order to identify significant trends and correlations spanning across multiple studies.

3.5421 Store-Related Attributes

Convenience, customer service, brand reputation, store design, atmosphere, and the company's ethical reputation are the main influential store-related attributes that form a brand (Chan & Wong, 2005). Although e-commerce is a successful and convenient method for retail garment sales, physical retail stores are necessary to reach multiple demographics. Retail stores provide an opportunity for a company to design a sales environment with a navigable store layout, pleasant atmosphere, enhanced customer service, and fitting rooms for customers to try on clothing. Marketing strategies and consumer awareness plans can be implemented within the aspects of a store in order to improve the brand reputation and eco-fashion purchases (Beard, 2008; Chan & Wong, 2012). Chan and Wong (2012) surveyed shoppers at a mall in Hong Kong and found that the store-related attributes can have a significant influence on consumer eco-fashion purchasing decisions.

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Beard (2008) reported that consumer-purchasing decisions are heavily influenced when shopping in a retail store. The store is saturated with marketing campaigns, product images, brand and clothing information, and pleasant shopping atmospheres created with music and employees providing high levels of customer service. Physical retail stores are not always as convenient as online shopping, but they provide an environment that companies can actively engage customers in order to achieve their sales and marketing goals (Beard, 2008). There are pros and cons regarding convenience in both online and physical retail stores. It is always nice to be able to purchase something in the comfort of your own home, but if the customer purchases an item that is the wrong size having the ability to exchange the item at a physical location is extremely convenient. Additionally this inconvenient fitting problem would not happen if customers were able to try on the clothing prior to purchase.

3.5422 Garment Related Attributes

Garment related attributes such as the design of the garment, style, quality, fit and price have shown to be the most significant influencing factor for consumers when purchasing clothing (Chan & Wong, 2012). The price of organic cotton clothing has consistently presented as an issue for consumers considering purchasing an eco-fashion product. "Price and style are dominant factors" when customers consider purchasing organic cotton products (Niinimäki, 2010).

Clothing related attributes are considered much more often with consumers when making an eco-fashion purchase than whether or not the purchase is socially and environmentally responsible (Solomon & Rabolt, 2004). Participants in a survey conducted by Carrigan and Boulstridge admitted that the price, value, and quality of a

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garment influenced their purchasing decisions more than societal concerns (Carrigan & Attalla, 2001).

Joergens reported in 2006, consumer personal needs were the primary consideration when deciding which garment to purchase. Customers polled at Walmart concluded that “consumers are not willing to pay more for environmentally friendly products unless they perceived direct personal benefits” (Sathe & Crooke, 2010). The findings from the Walmart poll reported that consumers prioritized their purchasing decisions based first on clothing style, then price, and finally color and whether the product was sustainably produced or not (Sathe & Crooke, 2010). “They want it to be a good design, they want it at a reasonable price, then they look at the fiber aspect” (Wilson, 2004).

According to Cotton Incorporated (2008) they have reported that the concern for the cost of apparel has increased among consumers, and the concern for whether a garment is environmentally friendly has reduced in importance. Cost is a hindrance for consumers, and often organic and environmentally friendly products cost more (Yan et al., 2012). In England, customers stated that they wanted products that were environmentally friendly, but when these products were introduced, they were not purchased due to the higher prices (Pearce, 1990). Eco-fashion consumers that have shown an interest in purchasing organic cotton garments have also shown a willingness to pay a price premium of up to 10% or more for these products (Chan & Wong, 2012; Myers & Stolton, 1999; Roberts & Bacon, 1997). Organic cotton garments are considered an emerging niche product that is commonly sold at a higher price than their conventionally produced counterparts. If eco-fashion companies were able to reduce

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costs and release an organically produced textile at a comparable price to conventional garments, the level of sustainable and responsible cotton production in the garment industry would exponentially increase.

3.5423 Environmental Attributes

The environmental impact that a garment has throughout production can be measured by the level of water consumption needed for garment production, levels of pollution, sustainable (or unsustainable) manufacturing methods, and levels of energy usage throughout the supply chain. Consumer awareness and activism that is demanding environmental sustainability and responsibility is increasing in the garment industry. The increase can be seen in significant positive correlations in data analysis between environmental attributes and both store and garment related attributes.

Multiple studies have identified significant influences on consumer purchasing decisions stemming from environmental awareness and concerns (Butler & Francis, 1997; Ogle, Hyllegard, & Dunbar, 2004; Hawley 2006; Birtwistle & Moore, 2007; Staikos & Rahimifard, 2007). Consumers that have expressed a willingness to pay more for organic cotton garments are aware of the negative environmental impacts that conventionally produced garments cause from chemicals introduced during conventional harvests (Lin, 2010).

Additional research, consumer education, public awareness campaigns, and targeted marketing strategies need to be implemented in order to initiate a significant change in the cotton industry. A multilateral approach appealing to consumer desires while simultaneously increasing awareness needs to be developed in order to maximize future organic cotton garment sales. This increase in consumer demand will force

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conventional fast-fashion clothing companies to transition to long-term sustainable business models that appease the environmental concerns from consumers.

Chapter Four

METHODS & DATA ANALYSIS OF SEATTLE CONSUMER BEHAVIOR

4.1 Introductions

The study designed and reported in this paper is to gain insight into consumer behavior regarding the motivating factors in clothing purchases in order to assess and improve the organic cotton garment industry. The survey conducted in this paper focuses on the retail end product sector of the organic cotton production supply chain. Focusing on the consumer demand provides insight into what drives garment purchases, which can help identify ways to maximize industry growth.

This survey was conducted from a small sample population from consumers that reside in Seattle. The demographic in Seattle consists of consumers that are known to be progressive, environmentally conscious, with an above average income. Organic cotton garments are considered a niche product that is purchased by environmentally conscious, progressive, and informed consumers. The Seattle Demographic sample population is the ideal control group to use in order to provide further insight into purchasing decisions that will assist in future marketing strategies and areas to focus on in order to increase sales and demand for organic cotton garments.

4.2 Designing the Survey

The survey questions were modeled from a survey written by Ting-Yan Chan and Christina W.Y. Wong (2005) in “The consumption side of sustainable fashion supply chain.” This survey was used as a baseline model for the one conducted for this paper because it provided clear and concise questions that identify different attributes in a buyer’s decision-making process. The survey focused on consumer purchasing behaviors

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associated with store attributes, environmental attributes, and garment attributes. These attributes are the key influential consumer decision-making factors in the targeted demographic.

Another influential source was the survey conducted and published by Ruoh-Nan Yan, Karen H. Hyllegard and LaVon F. Blaesi that explored consumer behavior and attitudes towards marketing. Their questionnaire used a Likert-type survey with questions regarding brand reputation and price premiums. The level of importance of these two factors was discussed in their analysis and embodied in their survey. There has been a considerable amount of research conducted regarding brand reputation and price premiums, because these are factors that can be adjusted accordingly in order to maximize sales.

The survey developed for this paper was given to a sample population consisting of 94 people who are residents of the greater Seattle Metropolitan Area. The questions were delivered to the participants through targeted social media campaigns and person-to-person data collection. These collection methods helped to ensure a diverse group of consumer participants spanning different socio-economic classes. A Multi-Response Permutation Procedural (MRPP) analysis was conducted with PC-ORD software and a Bonferroni Correction was made to counteract the problems that arise from multivariate comparisons. Additional trends and behaviors were observed when plotting, graphing, and charting the various compilations of individual variables.

4.21 Participants

The participants that took the survey were Seattle residents covering a wide range in age. Out of the 94 people who took the survey 64% (60) were women, 34% (32) were

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men, and the remaining 2% (2) chose not to disclose their gender. The Seattle population is very different from the previous demographics within populations where studies have been conducted that observe consumer behavior. Previous research has focused on college students, or consumers in various large international cities including London and Hong Kong. There is limited data regarding consumer behavior within the garment industry focusing on consumers that reside in the United States.

The residents of the city of Seattle provide an ideal demographic to target for this study due to the reputation for consumers who are environmentally conscious, health oriented, and have an above average income per capita level within the United States. The Seattle Demographic sample population is the ideal control group to use in order to provide further insight into purchasing decisions that will assist in future marketing strategies and areas to focus on in order to increase sales and demand for organic cotton garments.

The city of Seattle is located between the Olympic and Cascade mountain ranges and is bordered to the west by the Puget Sound. The easy access to hiking, kayaking, and other outdoor activities increases the level of ecological awareness for residents. Lin (2010) found that residents of Hawaii were more likely to buy organic products due to their heightened level of awareness of environmental issues and sustainability that stemmed from their island location and limited access to resources. “Researchers suggest that people who actively enjoy and invest in outdoor experiences, such as consumers of Patagonia’s products, will pay more than average American consumers” (Casadesus-Masanell et al., 2009). Researching targeted demographics focusing on consumers that are likely to purchase organic products will maximize the potential market growth by

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altering sales strategies based on consumer purchasing decisions observed and identified during the survey process.

4.22 Site Description

The active solicitation for in person participation of the survey was completed in the downtown area of Seattle, within a 3 block by 5 block area (Figure 15). The survey solicitation zone boundaries were Union to the South, Pine to the North, 1st St. to the West, and 6th St. to the East. This area was chosen because of the diversity of consumers due to the large quantity of retail chains, high-end department stores, boutiques, outdoor recreation stores, and malls. Several of the clothing stores offered organic cotton garment products, including Gap, Nordstrom's, and H&M.

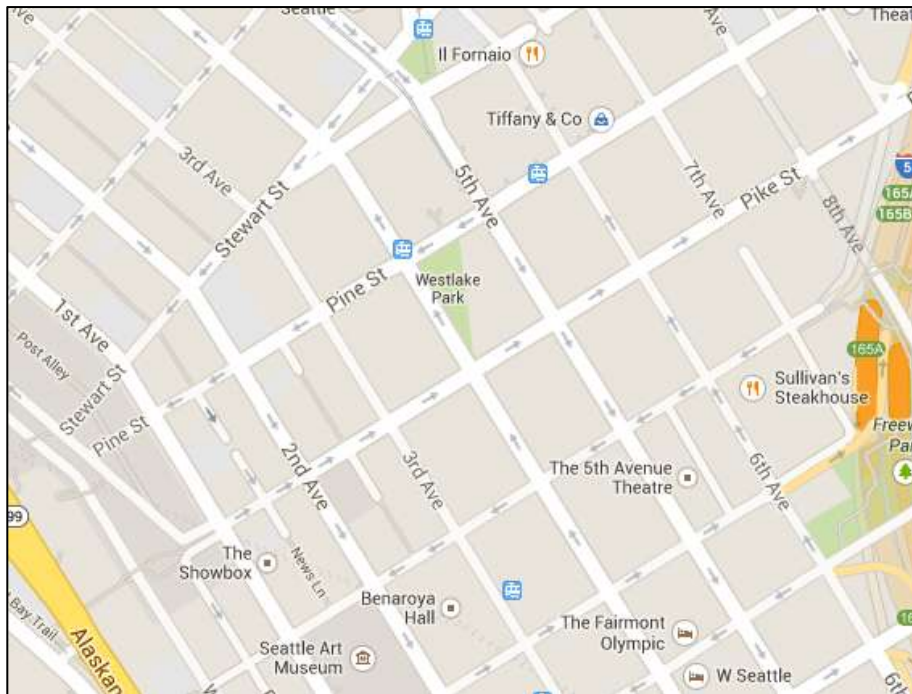


Figure 15. Map of downtown Seattle. This is a map of the downtown shopping area of Seattle where all the surveys that were conducted face-to-face were gathered. Source: Google Earth.

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4.23 Measures

The initial section of the survey consisted of five multiple choice questions used to identify specific key demographics including, age, gender, whether or not participants had children, their annual income and education level (Figure 16). There was no question regarding the participant's race due to the lack of empirical evidence that race has any effect on a consumer's garment decision-making process.

Gender:				
Female	Male	Other		
Personal Annual Income:				
Less than \$30,000	\$30,000-60,000	\$60,000-90,000	\$90,000-120,000	\$120,000 or Greater
Age:				
25 or younger	26-35	36-45	46 or greater	
Family:				
Have Children	No Children			
<u>Highest Education Level Completed?</u>				
Less than High School	High School/GED	Associates	Bachelors	Graduate or higher

Figure 16. Demographic questions. These are the five demographic questions asked on the survey distributed to Seattle shoppers.

The next section of the survey consists of questions regarding clothing attributes that were extrapolated from questions that were used in a previous study conducted by Chan and Christina W.Y. Wong. There are three sections that contain five questions each utilizing a Likert-type ranking system from one to five with one being not important and five representing very important. The questions modeled after Chan and Wong's survey focus on price, quality, and garment design. Two additional questions were added to the survey conducted for this paper regarding the fit of the garment, and current trends within

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the retail garment industry. There is a considerable amount of evidence supporting the notion that consumers make purchasing decisions based on how well the garment fits.

The results of this survey support this with 87 out of 93 respondents stating that the fit of a garment is important to very important.

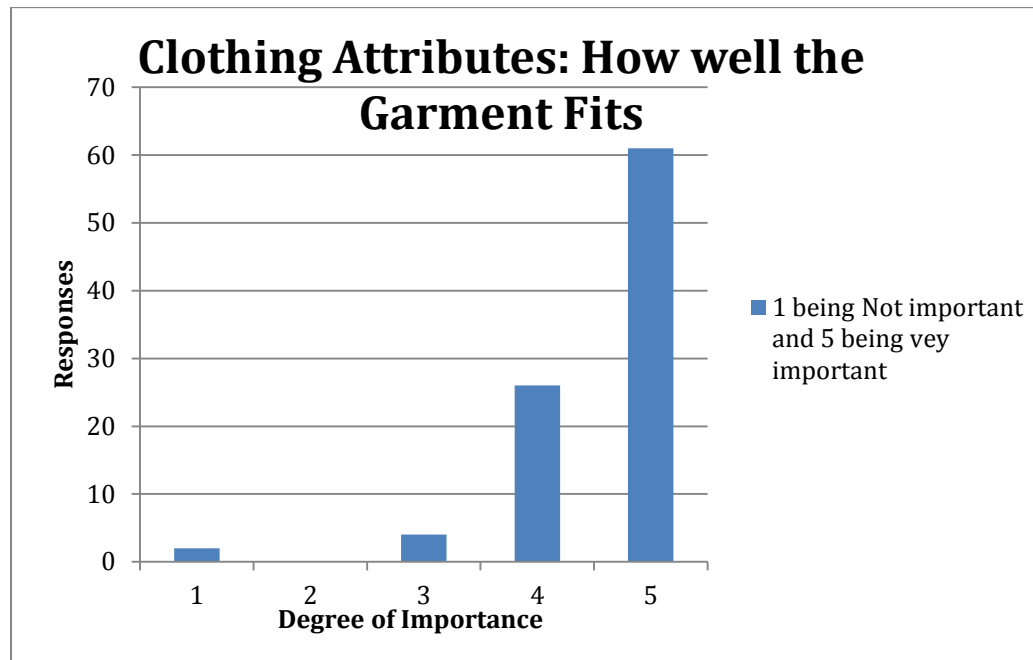


Figure 17. Seattle consumers ranking the importance of garment fit.

The question regarding current trends within the retail garment industry was added due to evidence from other studies that show a correlation between purchasing decisions based on clothing trends. A consumer behavior study in 1983 developed the Roger's theory, which identifies five different types of consumers. The five consumers are the innovators (2.5%), the early adopters (13.5%), the early majority (34%), the late majority (34%), and the laggards (16%) (Rogers, 2003). Previous studies have shown that women frequently make clothing purchases based on current trends, rather than the need for new clothing (Beaudoin et al., 2003). It is important that companies developing

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organic cotton garments focus on current trends in order to increase sales and stimulate additional growth in the industry.

<i>Clothing Attributes</i>	Not Important / Very Important				
Design appeal	1	2	3	4	5
Currently trendy	1	2	3	4	5
Quality	1	2	3	4	5
Price	1	2	3	4	5
How well the garment fits	1	2	3	4	5

Figure 18. The five questions on the survey within the clothing attributes section.

The next section of the survey focuses on clothing store relates attributes (SRA), and the importance of the reputation of specific brands. Studies have shown that “brand names offer associations and meanings to consumers in such a way that they become part of an individual’s knowledge structure” (Bao, Shao, & Rivers, 2008). “According to a recent Cone/Roper survey of two thousand American adults, 80 percent form more positive images of a company that they know supports causes of importance to them. In addition, two thirds say they would switch brands or retailers and would pay more for the product, and indicate that they have a greater trust in companies linked to good causes” (Solomon & Rabolt, 2004). Brand reputation is an important influential factor that guides consumers towards their purchasing decisions.

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<i>Clothing Store-related Attributes</i>	Not Important / Very Important				
Brands environmentally friendly practices	1	2	3	4	5
Customer service	1	2	3	4	5
Convenience	1	2	3	4	5
Stores design and atmosphere	1	2	3	4	5
Brands good reputation	1	2	3	4	5

Figure 19. The five questions on the survey within the store attributes section. This section of the survey asks the participant to rank the degree of importance for each of the five individual question's pertaining to store-related attributes.

The next section of the survey focuses on the level of importance regarding environmental attributes of garment production to the consumer. These questions are designed to quantify the value a consumer places on the environment and their garment as they relate to each other. The questions in this section were designed based on Pearson's (2006) five key components that define sustainability and environmental effects of cotton production.

<i>Environmental Attributes</i>	Not Important / Very Important				
Garments that use less and contaminate less water during manufacturing	1	2	3	4	5
Clothes that have minimized pollution during construction	1	2	3	4	5
Clothes that have more sustainable manufacturing methods	1	2	3	4	5
Clothes that use less energy during production	1	2	3	4	5
When given a choice, I choose the garment less environmentally harmful	1	2	3	4	5

Figure 20. Questions within the survey relating to environmental attributes. This section of the survey asks the participant to rank the degree of importance for each of the five individual questions pertaining to their environmental concern.



Figure 21. Seattle consumers ranking of a brand’s environmentally friendly practices. This graph shows the responses to the question asking the participant to rank the importance of a brand’s environmentally friendly practices. The majority of the responses vary from neutral to somewhat important.

The final question of the survey was a multiple choice question asking the participant how much more they would be willing to pay for organic cotton clothing. This question has been asked in multiple studies, and the data from this study can be used to compare the Seattle consumer responses to consumers in other markets. Results of this survey question will assist in providing insight into whether Seattle consumers provide the appropriate market for eco-fashion industries to target.

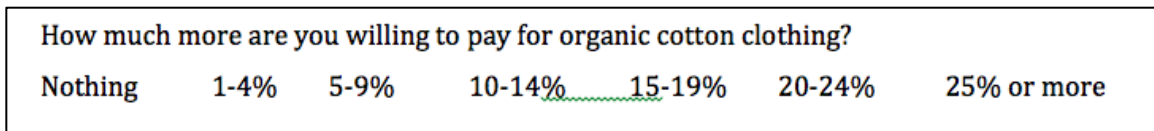


Figure 22. Price premium question.

4.24 Procedures

Multiple approaches were utilized to find survey participants that reside in the greater Seattle metropolitan area. There were a total of ninety-six surveys completed,

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fifty-eight were filled out in person utilizing active solicitation methods, and thirty-six surveys were completed online accessed from social media websites.

The active solicitation of survey participants was conducted over a weeklong period starting on January 3rd, 2014 in downtown Seattle. An assistant and I solicited people walking by to complete the survey and made sure to not target any specific demographic. The only guideline was that they had to reside in Seattle. Thirty surveys were filled out on the first day that it was conducted. Over the week, the remaining twenty-eight surveys were completed by soliciting employees and customers at various retail stores, banks, and restaurants.

The thirty-six surveys that were filled out online were completed using an online form that was created and accessed utilizing Survey Monkey. I utilized social media to solicit Seattle residents to complete the survey, and the majority of the participation came from an online social media group for public safety workers in the Seattle Area. This group was made up of 172 total members consisting of firefighters, emergency dispatchers, and police officers. The online survey was available for participation for one week starting on January 4th, 2014.

4.25 Hypothesis Development

Previous research regarding consumer behavior has identified areas that influence consumer-purchasing decisions, and this information was used as a guide to identify the focus of the statistical analysis. The research focused on store related attributes, garment attributes, and environmental attributes affecting the consumer purchasing decisions, specifically decisions regarding eco-fashion. Previous studies have shown that the store related attributes and garment attributes are the main influential factors of consumer

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purchasing decisions and they overshadowed the environmental attributes of the garment (Chan & Wong, 2012).

There were three hypotheses questions developed to identify any relationships between the store related attributes and garment attributes, specifically as they relate to environmental attributes. Identifying any relationship, or lack thereof, will help to identify areas to focus on and improve on in order to promote growth and increase sales of eco-fashion garments.

Hypothesis 1: Store related attributes will have a positive relationship with environmental attributes.

Null 1: *Store related attributes will not have a positive relationship with environmental attributes.*

Store related attributes that influence consumer purchasing decisions are identified in the survey questions about brand reputation, store design, convenience to the consumer, customer service, and brand environmentally friendly practices. Retail stores are integrating environmentally ethical practices into their environment, and the fashion consumer takes these attributes into account when making an eco-fashion purchase (Creyer & Ross, 1997).

Brand reputation is becoming increasingly important for the environmentally conscious consumer, with increased transparency of brand practices available to the public through online publications. The atmosphere and layout of a store including lighting, quality, customer service, and music can either attract or discourage potential retail fashion purchases. Stores that offer recycling services or known for their environmentally friendly practices can influence where the consumer decides to shop, along with the level of convenience for the consumer to access the eco fashion garments

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(Chan & Wong, 2012). These factors lead me to hypothesize that store related attributes will have a positive relationship with the environmental attributes identified in the survey.

Hypothesis 2: Garment related attributes will have no relationship with environmental attributes.

Null 2: *Garment related attributes will have a relationship with environmental attributes.*

The garment related attributes identified in the survey are design appeal, trendiness, quality, price, and how well the garment fits. These attributes have been shown to have an importance in the purchasing decisions for all fashion consumers, and are generally materialistic in nature. Since these attributes influence the decisions of every fashion consumer I hypothesize that there will be no relationship between the garment related attributes and the environmental attributes of the garment.

Hypothesis 3: The majority of Seattle consumers will be willing to pay the price premium of 10% or more for organic cotton clothing.

Null 3: *The majority of Seattle consumers will not be willing to pay the price premium of 10% or more for organic cotton clothing.*

Eco-fashion products are offered to a consumer at a price premium above the cost of conventionally produced products. Previous studies have shown that eco-fashion consumers are willing to pay a price premium for environmentally responsible products, and “that a 10 percent price premium would not affect fashion consumers’ willingness to purchase eco-fashion” (Chan & Wong, 2012). The survey I conducted focuses on residents of Seattle, who are known to be more environmentally conscious and responsible than other cities in the United States and internationally. Based on this

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sample population demographics' I hypothesize that the Seattle fashion consumer will be willing to pay a price premium of 10% or more for organic cotton clothing.

4.3 Statistical Analysis

Survey participants were kept anonymous, and each completed survey was assigned a number. The raw ordinal and categorical data was entered into an excel spreadsheet where it was analyzed and graphed based on the answers for each individual question. The graphs and data were reviewed, and compared in order to identify any trends, anomalies, and significant findings relating to my initial hypotheses.

I employed a confirmatory factor analysis to validate the data reliability using a Cronbach's Alpha reliability test with SPSS 17.0 software. This test is a measure of internal consistency showing how closely related the set of data is when measured as a group. The standard level for consistency of statistical data with a Cronbach's Alpha test is any result above 0.7. The Cronbach's Alpha coefficient range of all constructs is .800 that shows a high level of internal consistency within the data.

Statistics shown in the Table 10 provide correlation data for the individual variables and the Cronbach's Alpha consistency level for the data set if the respective variable has been deleted. There would be a slightly higher, but not significantly higher, level of consistency if any of the demographic questions or price variable were removed from the data set.

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.800	.772	21

Table 10. Summary of Reliability Statistics and Cronbach's Alpha scor

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Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
What is your gender	66.16	101.032	-.058	.272	.806
Income Levels	65.50	100.455	-.054	.434	.819
Age	65.59	97.728	.102	.462	.805
Have Children?	66.14	100.574	-.015	.329	.805
Highest Level of Education	64.52	99.578	.009	.220	.809
Design Appeal	64.00	93.146	.347	.342	.793
Current Trend	65.22	94.355	.251	.235	.798
Quality	63.69	91.273	.528	.527	.785
Price	63.76	99.535	.016	.356	.809
How well it fits	63.32	92.873	.468	.447	.788
Brand environmentally friendly practices	64.51	84.702	.672	.594	.772
Customer Service	63.82	95.608	.207	.259	.800
Convenience	63.97	95.830	.210	.313	.800
Store design and atmosphere	64.39	94.555	.243	.240	.799
Brand Reputation	64.53	94.769	.215	.277	.800
Amount of water wasted	64.59	83.548	.706	.806	.769
Pollution amounts during construction	64.43	81.911	.740	.817	.766
Sustainable manufacturing methods	64.44	82.272	.723	.863	.767
Energy amounts during production	64.66	82.431	.760	.850	.766
Choose less environmentally harmful	64.27	81.771	.759	.717	.765
How much more are you willing to pay for organic cotton clothing	65.38	89.204	.355	.377	.794

Table 11. Descriptive Statistics, correlations and reliability data contingencies.

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4.31 Common Method Variance

I conducted a Harman's single factor test to check for common method variance. Since all data was collected from a common method (my survey), there is a risk of common method bias in the data. This means that there is a possibility of variances occurring from the measurement methods rather than from the data retrieved from the survey, which can cause biases that inflate or deflate relationships between two variables leading to both type I and type II statistical errors (Podsakoff et al., 2003), since this level of variance for a single factor is below 50% there is a low possibility of any errors being caused by method bias.

Component	Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	5.569	26.520	26.520

Extraction Method: Principal Component Analysis.

Table 12. Total variance explained.

4.32 Data Analysis

After evaluating the data from the survey a Pearson's Correlation was used to test Hypothesis 1 and Hypothesis 2. Prior to running this test to make sure that the data met the criteria a Pearson's Correlation test was ran. The data must be normally distributed, interval level, linear, and free of any significant outliers. The demographics data and price premium data were removed from the correlation analysis since it did not meet the criteria for the test and the hypotheses did not require it.

The next step in performing the correlation test was to group my data sets into the three sections that were identified in the survey. Each section (Garment Attributes, Store Related Attributes, and Garment Attributes) in the survey consisted of five Likert-type

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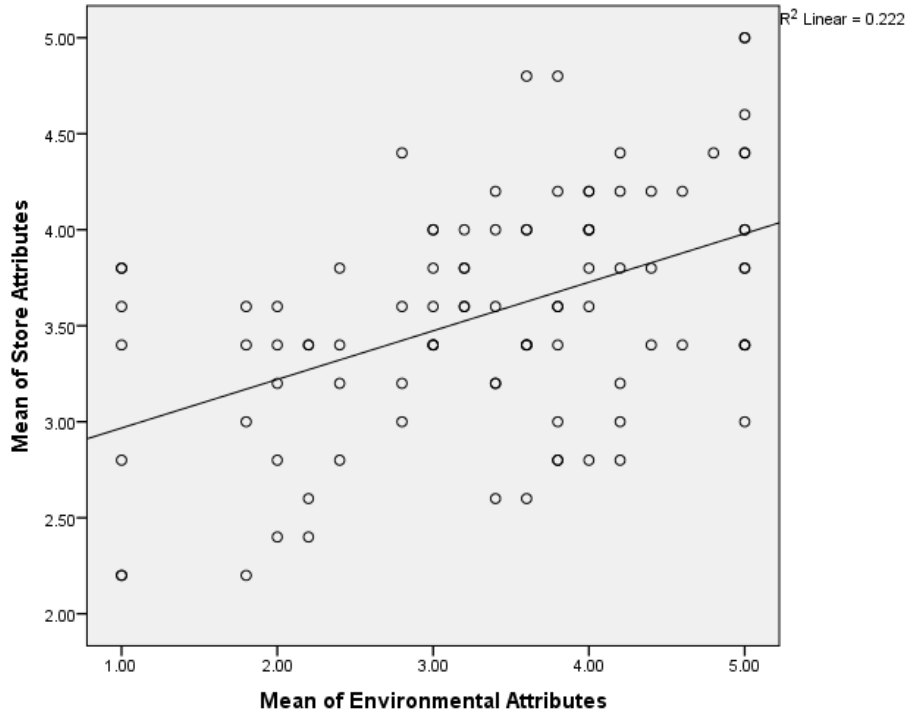


Figure 23. Correlation between environmental attributes and store related attributes.

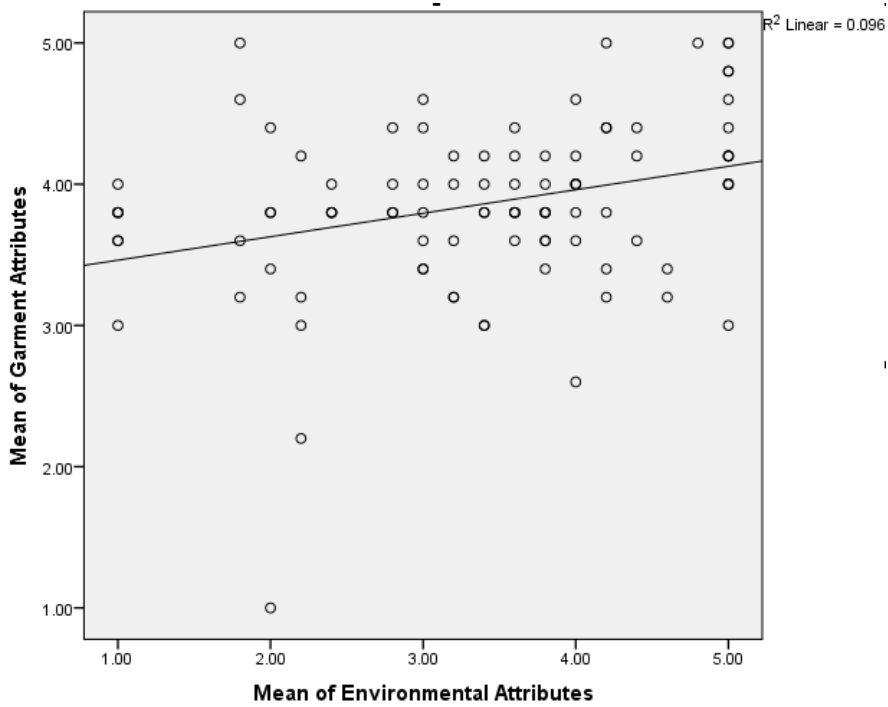


Figure 24. Correlation between environmental attributes and garment related attributes.

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questions from one to 5. I computed the mean response per survey participant for these five questions and developed three data sets consisting of the mean responses from the five questions from each section. The three sections were listed as the MeanGarment, MeanEnvironment, and MeanStore, relating to their previous counterparts; garment attributes, environmental attributes, and store related attributes, respectively.

Table 13 shows the results from a Pearson's product-momentum correlation coefficient that was computed in order to assess the relationship between environmental attributes, store related attributes and garment attributes. The data was then analyzed utilizing a Multi Response Permutation Procedure (MRPP) through the PC-ORD program. The data was divided based on each individual question response and plotted on a matrix. A separate matrix was developed and organized based on the demographics for each participant in order to identify relationships and trends based on demographics and the survey responses. If a question was not answered by one of the participants it was removed from the matrix prior to analysis. The MRPP was conducted in order to identify any relationships between income levels and the survey answers and found no significant relationship. Predictive data was gathered from the survey question regarding how much of price premium consumers would the customer be willing to pay, and the mean percentage from all surveys was entered into the results.

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Correlations

		MeanGarment	MeanEnvironment	MeanStore
MeanGarment	Pearson Correlation	1	.310**	.449**
	Sig. (1-tailed)		.001	.000
	Sum of Squares and Cross-products	35.072	20.308	15.817
	Covariance	.377	.218	.170
	N	94	94	94
MeanEnvironment	Pearson Correlation	.310**	1	.471**
	Sig. (1-tailed)	.001		.000
	Sum of Squares and Cross-products	20.308	122.157	30.924
	Covariance	.218	1.314	.333
	N	94	94	94
MeanStore	Pearson Correlation	.449**	.471**	1
	Sig. (1-tailed)	.000	.000	
	Sum of Squares and Cross-products	15.817	30.924	35.331
	Covariance	.170	.333	.380
	N	94	94	94

** . Correlation is significant at the 0.01 level (1-tailed).

Table 13. Correlations.

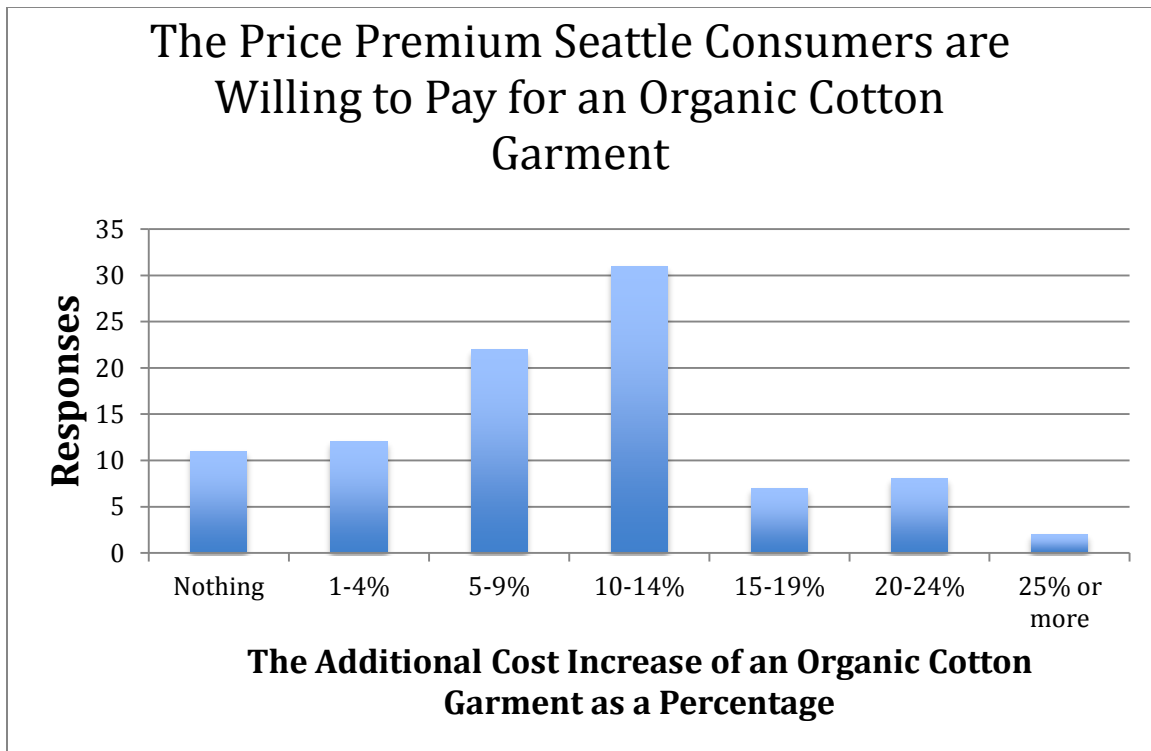


Figure 25. This graph shows the results of the Seattle consumer’s willingness to pay the price premium of an organic cotton garment. A majority of Seattle consumers are found to pay 10-14% more for an organic cotton garment, with the second majority willing to pay 5-9%.

4.4 Discussion

4.4.1 Comparing Attribute Results

Based on the Pearson’s Correlation analysis, the findings from the Seattle data show that environmental related attributes (ERA) have significant positive correlations between both store related attributes (SRA) and garment related attributes (GRA). These results support previous research study findings that were reviewed in the comprehensive analysis discussion in this paper about the level of importance consumers place on both GRA and SRA. The results are contradictory to Chan & Wong’s findings that stated GRA is not related to ERA. This may be due to the outdoor health conscious demographic within the Seattle population who place importance on style, functionality

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and fashion identity while still remaining concerned about the environmental impact of their clothing choices.

SRA displayed a stronger relationship than GRA did with ERA. This may be due to consumers who make purchases based on ERA do not place as much importance on the materialistic clothing qualities associated with GRA. It may also be that the Seattle demographic places greater levels of importance on convenience, atmosphere, and customer service when purchasing a higher priced eco-fashion garment. Most consumers place more importance on both SRA and GRA than on ERA, as reported in other research studies.

4.411 Store Related Attributes

The strong positive correlation between ERA and SRA was predicted due to the consumer support that Seattle residents give to local organic and ethically responsible businesses. The positive correlation shows that the participants in this survey represent consumers who recognize a brand's reputation and environmentally responsible practices when making a purchasing decision. This reflects the level of trust, respect, and overall experience the consumer has had when purchasing eco-fashion items from a specific company rather than the cheaper conventionally produced comparable garment from their competitors (Yagci, Biswas, & Dutta, 2009).

4.412 Garment Related Attributes

Within the garment related attributes (GRA) section of the survey the most important influential factors identified were fit, price, and quality respectively (Fierman, 1991; Magrath, 1992, Mandese, 1991; Roberts, 1996; Stisser, 1994; Whittemore, 1991).

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It is interesting to note the lack of importance that consumers contribute to the trendiness of the garment.

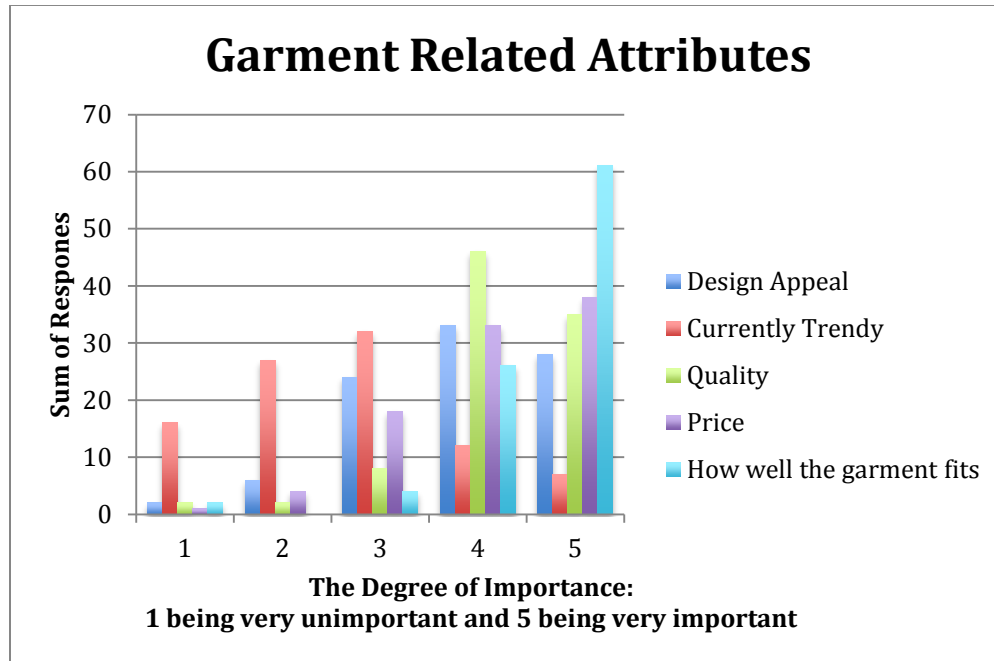


Figure 26. Level of Importance of Garment Related Attributes. This graph represents the responses based on the Likert-type questions about GRA that were presented to the Seattle survey participant sample population.

Forty-eight out of the ninety-four participants stated they would pay 10% or more for an eco-fashion organic cotton garment supporting my hypothesis. This willingness to pay a price premium represents a consumer demographic that is willing to sacrifice a reasonable, but not overly reasonable price, premium for the sake of environmental sustainability. Higher garment prices do play a role in consumer decision-making, but consumers also have concern for the environmental impact that their purchase supports (Lin, 2010). This research supports the Seattle study, that found consumers are very concerned about price, but are willing to pay 10-14% more for a garment that has minimal environmental impact. In the Roberts and Bacon (1997) study they recommended, “marketers are advised to emphasize the delicate balance of nature and

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how consumers can still consume, but in a more ecologically fashion” and “that consumers may be swayed by ecological appeals.”

	Hypothesis	Comments
H1	ERA is positively correlated with SRA	Supported
H2	ERA is not correlated with GRA	Rejected
H3	>50% of Seattle residents will pay $\geq 10\%$ PP for OCC	Supported

ERA=Employee Related Attributes
SRA=Store Related Attributes

GRA=Garment Related Attributes
PP=Price Premium

OCC=Organic Cotton Clothing

Table 14. Hypothesis

The level of importance that consumers claim to consider regarding environmental and ethical consumption is more than what the levels of consumption and market penetration in the organic cotton garment industry suggest. This is most likely due to the indirect and removed consequences of purchasing an item that negatively impacts communities in distant developing countries, rather than empirical observations from the consumer (Chan, 2012). This may also be due to the lack of consideration of the environmental implications associated with their purchasing decisions (Butler & Francis, 1997).

4.42 Research Implications

Consumer behavior regarding eco-fashion purchases can be influenced, predicted, and manipulated. Improving a company’s GRA and SRA would result in a slight increase in purchases based on ERA. Consumer attitudes towards specific brands and its respective SRA will influence environmental attitudes that the consumer has towards the company which can be an influential factor that is considered when making an eco-fashion purchase. When a store alters the SRA consumer perceptions regarding the environmental implications associated with that change may raise or lower the level of environmentally responsible behavior associated with the brand reputation. The SRA that

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consumers usually respond to is an increase or decrease in product prices that a company makes which may not represent the underlying environmentally responsible decision that initially prompted the price increases.

When companies make decisions based on increased ethical and environmentally responsible practices, customers need to be able to easily identify and understand the company's rationale; otherwise they risk the possibility of decreasing eco-fashion purchases while increasing costs. Brand reputation is critical to for eco fashion companies to maintain in order to sustain and increase the amount of loyal customer who trust the environmentally responsible claims claimed by the company (Phau & Ong, 2007). If a company properly develops a responsible, green, and ethical reputation, ethical committed consumers would purchase and promote their organic cotton garments despite the price increase from the premium added to cover the extra costs.

The majority of the survey responses emphasized a level of importance regarding brand reputation that ranged from important to very important. The somewhat important response was chosen the most (32 times), but important (28), and very important (14) represent half of all participants who seriously consider a company's reputation before deciding on whether to buy clothing from them.

Solomon and Rabolt (2004) wrote that environmentally motivated consume tends to be college educated, with an above average income, and most often female. Butler and Francis stated that "age was more useful in predicting purchasing behavior but was mitigated by the stronger effect of the general environmental attitudes." These

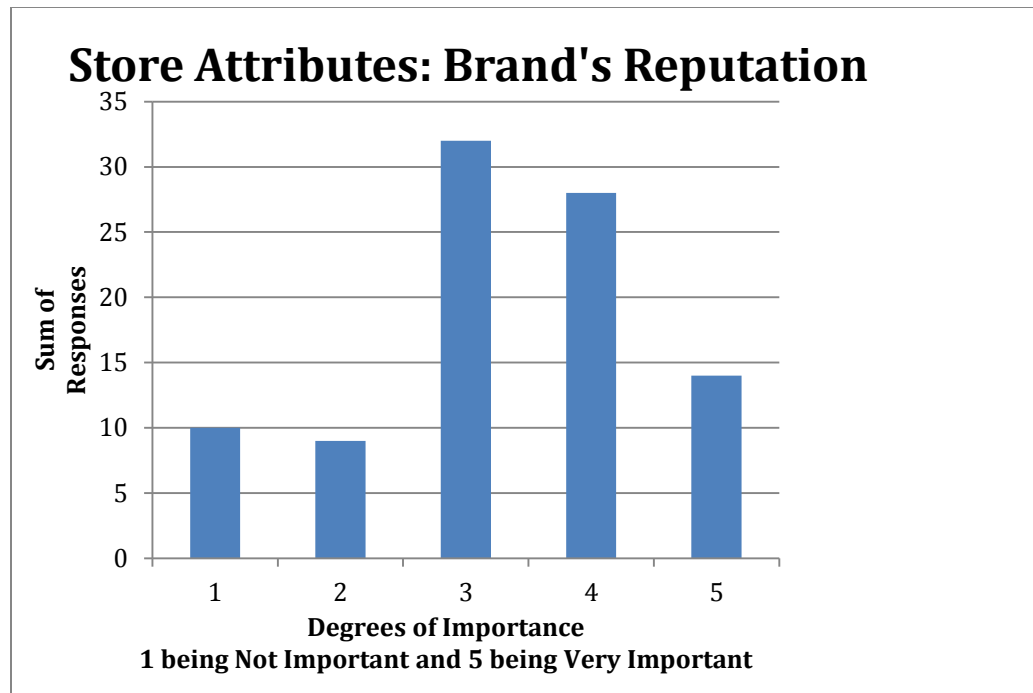


Figure 27. Brand Reputation. This graph shows the Seattle responses to the level of importance of brand reputation.

demographic generalizations and stereotypes were not observed in the analysis of Seattle participant responses. No significant relationship was identified between gender, income, and eco-fashion decision-making choices. This lack of relationship does not support or reject the previous findings. It only allows the observer to acknowledge the lack of supporting empirical evidence for the previous results extrapolated from the Seattle survey participant responses.

The lack of trends, patterns, or correlations identified between income and influential purchasing decision factors supports the idea that Seattle consumers support environmental responsibility and ethical companies based on internal motivating factors. The level of income for this demographic did not provide any information that would help predict future consumer purchasing trends based on the income per capita in the population. This is an interesting finding due to the high level of importance reported

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with an organic garment's price, meaning that consumers may be considering price as an important factor, but not necessarily because they can't afford the item.

The small percentage of consumers who responded with a high level of importance for the level of trendiness of the garment aligns with the minority 2.5%

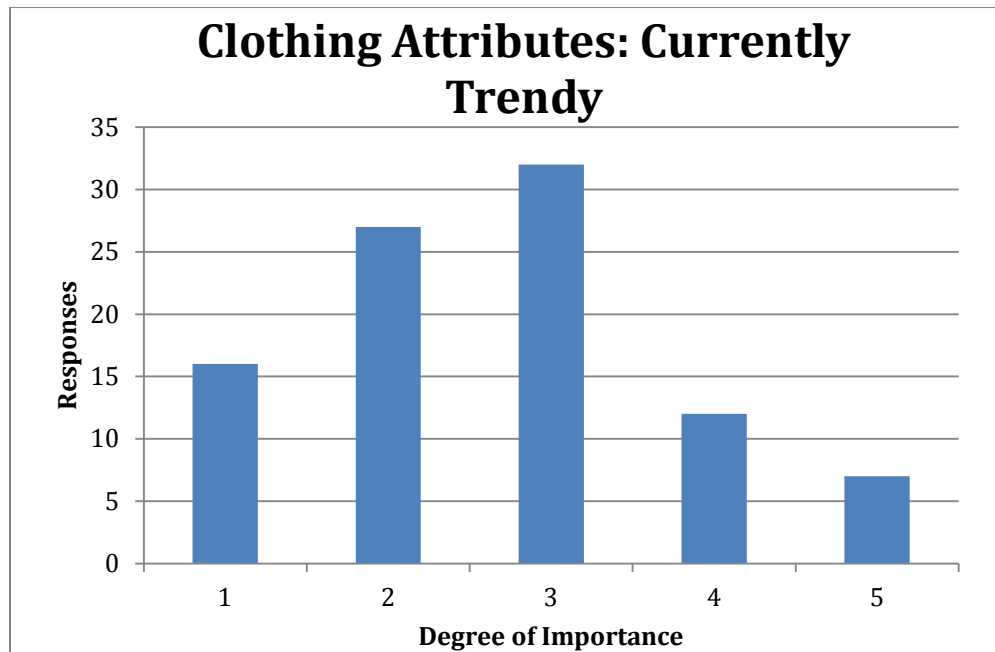


Figure 28. Seattle participant's level of importance to a garment's trendiness.

innovator personality type that is identified in Roger's Theory. Innovators were identified as consumers who adopt the latest and most current trends and innovations, which are consistent with the small number of participants that placed a high level of importance of trendiness when deciding on whether to buy an organic cotton garment (Rogers, 2003).

The results and trends identified in this paper provide additional insight into what drives consumers to make purchasing decisions relating to organic cotton clothing, specifically as it relates to SRA and GRA. Companies that are attempting to increase sales and growth within this sector of clothing sales should be cognizant of the delicate balance associated with implementing a price premium in order to cover the additional

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costs that are associated with environmental responsibility. The results of this study help explain the influence of price premiums, SRA, and GRA have on the successful marketing and sales of eco-fashion products. Consumers have consistently shown that they would choose the environmentally responsible choice if there were no changes in GRA and SRA including price, quality and convenience. The degree of change between these factors is significant and positively correlated with a moderate to strong relationship (Chan & Wong, 2012)

4.43 Limitations of Survey Data

The relatively small sample size of ninety-four participants provides a significant chance of inaccurate conclusions based on sampling errors, unreliable coefficients, and method biases resulting from one question accounting for a disproportionate response level. Additionally the lack of diversity found in small sample sizes could result in unreliable relationships based on demographic identification responses. These surveys were completed utilizing an anonymous self-reporting system about influential motivating factors. A participant's lack of self-awareness, understanding of personal motivations, level of integrity, personal accountability, and the desire to answer questions based on perceived socially acceptable responses could cause skewed data that does not accurately depict the true responses or actions that may be seen from passive observance data collection techniques.

Quantifying individual degrees of importance may create a scale that does not account for the true level of importance, or lack thereof, when choosing their responses. The data analysis compiled the data into three categories and calculated the mean responses from five questions within each category. This calculation method could result

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in disproportionate representations of the levels of importance a consumer feels about a specific factor because the very important response was chosen for only one categorical response, which is eliminated when calculating the categorical means. Lea-Greenwood (1999) conducted a study that helped identify the challenges that accompany researchers gathering information in order to identify an accurate degree of consumer behavior choices based on ethics and responsibility. Consumers often tend to answer questions more positively than their true purchasing behaviors reflect (Casadesus-Masanell et al., 2009). The concept of action speaking louder than words directly applies to consumer purchasing behaviors, where the answers a consumer provides does not align with their true purchasing patterns (Lea-Greenwood, 1999).

4.5 Areas of Opportunity

There are areas of opportunity that the organic cotton market can utilize to increase sales and overcome obstacles. Strategic business strategies can reduce risk and establish a stronger market starting with production, continuing through the supply chain, and with the finished product at the retail end. Businesses can make changes and influences logistically or to influence consumers.

4.51 Production

Identifying the areas of opportunity for market expansion within the organic cotton market will assist in identifying and overcoming the difficulties that emerge from market growth along the supply chain. Myers and Stolton (1999) identify three key factors that would stimulate the organic cotton market. The first factor is the portion of the market consisting of environmentally motivated consumers who make purchasing decisions based on environmentally responsible practices.

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Secondly, the increased pressures from the government through regulatory methods outlined in environmental legislation are designed to motivate and reward companies that pursue alternative production methods in an effort to combat climate change and environmental degradation. The last main factor that drives the organic market is increased emphasis within companies to develop less resource intensive and waste reducing methods of production to maximize efficiency and consumption levels (Myers & Stolton, 1999). A survey of U.S. organic farmers resulted in drafting requirements from farmers in order to insure long-term success. The farmers stated that the areas that needed to most attention to reduce risk and improve their industry would be, organic cottonseeds need to be commercially available for purchase and continual GOTS improvement. The GOTS certification procedures and ongoing innovative market research made available to organic farmers has helped the market with transparency and of educational needs (Organic Trade Association, 2014).

4.511 Market Structure

Conventional methods of cotton production are being promoted and protected by leaders in the industry, because they refuse to acknowledge the lack of sustainability in cotton production. The global cotton market is made up of large publicly traded corporations, and the investors of these companies expect and demand a decent return on their investment. In a business model like this, future projected growth of the market and profit and loss projections are developed to appease the investors. An incorrect way to produce future forecasts is to dismiss the fact that the natural resources essential to production are being depleted at a consistently increasing rate and the true cost of pollution is not a concern.

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Investors are appeased because short-term projections only reflect the increased profits due to the reduced short-term costs associated with the conventional production methods. This approach is irresponsible for leaders in the industry not only because of the damage they are causing the environment, but also because of false confidence they are giving investors. A responsible and more realistic method of forecasting can be achieved by utilizing an interdisciplinary analysis combining data compiled from economic, environmental, sociological, and consumer behavioral studies to accurately project future growth and costs in the cotton market. Sustainable technological developments have not advanced beyond consumer consumption; therefore studying consumer behavior is necessary to pursue sustainable development (Jackson, 2008). The following is a synthesis of such research combined with a pilot study that gathered data from a sample population.

4.512 Governments

One of the hurdles identified by farmers was the level of corruption within host nation governments that manipulate market activity and deny assistance to organic cotton farmers. Tax credits and incentives are not equitably distributed to farmers, and some legislators promote processes that discourage, rather than encourage, organic cotton production. The current conditions and attributes of organic cotton in the global market is one of the rare cases where government subsidies and tariffs need to be implemented in order to assist and insulate the commodity from competitive industries positioned to increase market stress and volatility in order to eliminate the emerging threat within the industry (Myers & Stolton, 1999). Tariffs have the characteristic of multiplying the cost due to the vertical structure of this industry (Nordas, 2004). The WTO has made

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considerable progress in the promotion of equitable conditions of organic cotton within existing subsidized markets. The WTO issued a ruling in 2007 declaring that the governments of both China and the United States were subsidizing and protecting conventional cotton in the global market, which undermined global free trade agreements. Export and import subsidies, favorable border protection standards, and tax credits reduced by more than 50% in these countries after the ruling was released by the WTO (Page & Ritchie, 2009).

4.513 Production Level Improvements

There currently is a shortage of organic cotton seed supplies that farmers, scientists, and analysts are making a collaborative effort to solve this problem before the levels of demand create a shortage that artificially inflates organic cotton prices in the global market (Truscott et al., 2013). “Little work is being done to improve the cottonseed through traditional breeding techniques” (Organic Trade Association, 2014). The current shortage in organic cottonseeds is limiting the availability of different seed options to organic farmers, and as this problem progresses, farmers face an increasing level of difficulty of access to organic cottonseeds. The increased usage of genetically modified (GM) seeds for cotton farming (~43% of all seeds are GM) is reducing the genetic diversity in cottonseeds limiting the availability of viable organic cottonseeds. A large amount of cotton farms within the cotton industry are small-scale farms and this small business model has increased the demand for organic cottonseeds instead of the GM varieties. GM seeds do not provide any genetic diversity, and cost more than organic seeds. These seeds also cannot be reproduced during a harvest due to the patent that the private companies that produce these seeds hold on the intellectual property rights of the

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cottonseed (Page & Ritchie, 2009). Large corporations with unlimited resources have directed the areas of focus through grants and access to funds for agricultural research to mainly progress in the GM sector while the organic cottonseed supply problems are neglected.

The development of this seed shortage has changed farming practices with farmers making sure to stockpile their seeds, utilizing methods that have been practiced for years in both Egypt and Turkey, in order to prevent future supply shortages. Increased transparency and activism against private monopolies that reduce biodiversity in order to eliminate competition needs to happen in order to actively promote organic cottonseed research programs and projects (Textile Exchange, Cotton Briefing, 2011). A system needs to be implemented in order to protect seed diversity, stockpiles, and ongoing research and development within the organic farming industry (Truscott et al., 2013), because farmers need to have new seeds every 2-3 years to combat climate change (Ferigno, 2011).

With any kind of technological advances in an industry there should be an increase in market growth, because “material technology is a competitive advantage” (Nordas, 2004). Defoliants and weed control are areas that need to be improved, as organic cotton farming develops within the market. The organic cotton farming process faces production challenges associated with yield quantities resulting from the lack of ability to utilize chemicals and defoliants. Innovative technological advances need to continually be developed through a focus on market improvement based on research and development in order to improve organic cotton harvest yields and quality. New techniques and technologies need to be developed in order to reduce the amount of

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manpower required to adequately manage weed and pest control. These improvements would drastically reduce overhead costs, which would help organic cotton companies to produce reasonably priced garments.

4.514 Economies of Scale

Strategic partnerships between large retail companies and producers throughout the organic cotton production supply chain could provide a mutually beneficial relationship with a common goal of increasing sales and market growth within the organic cotton industry. Implementing economies of scale strategy would reduce production costs due the partnership's ability to disperse the costs across the entire supply chain, preventing the concentration of cost in one area of the supply chain, common within the organic cotton market.

Not having production centers that are exclusively used for organic cotton slows down the fabric production process and this gap in production efficiency is where organic cotton producers accrue significant costs. When a mill or weaving center is processing organic cotton it must first clean all parts of the machine that contact the fiber in order to maintain the organic standard for cotton in the industry. This separation and sanitation process, especially when done for small amounts of organic fiber, is a key area of inefficiency within the production process.

Increasing the amount of organic cotton that is processed throughout the supply chain will help increase the market stability of organic cotton, and reduce the risk of large price fluctuations due to supply issues that may arise from a single producing nation (similar to the 2009 price dip based on India's internal affairs). Economies of scale decrease the cost of production when larger amounts of organic cotton are available to be

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processed at once. Improved distribution processes and increased market availability will help reduce the price premium that has been identified as a key deterrent for consumers deciding whether or not to purchase organic cotton garments. Elaina Duffy, the Sustainable Innovation Director for Nike Inc. was quoted saying, “because of the volume, we’ve been able to keep the pricing comparable” (Wilson, 2004). With the incorporation of organic cotton products into apparel lines by large corporations, such as Gap Inc., H&M, and Nike, organic cotton producers are able to significantly reduce costs due to the large scale streamlining of production processes (Myers & Stolton, 1999). The size of the organic cotton market has just recently reached the levels that are needed to take advantage of reduced costs by streamlining processes through an economy of scale. This significant growth in the industry has been successful enough for the gradual phasing out of cotton blend products that were developed in order to reduce costs from cotton supply and production issues.

4.52 Business Strategies

Retail companies can entice all consumers and market to the environmentally conscious consumer with strategic business strategies. Through brand image, marketing, and the type of organic cotton incorporation, companies can increase sales while reducing environmental damage. Organic cotton garments are adaptable for the mainstream ready to wear industry, retailer’s just need to price and design eco-fashion appropriately.

4.521 Brand Image

Businesses can also improve their reputation and appeal to consumer’s ethics and pathos by providing an organic cotton garment option. To keep a strategic foothold within the ready-to-wear market companies need to adjust strategies as the consumers

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have been reported to, choosing environmental products and favoring brands with good environmental reputations (Kim & Damhorst, 1998). Companies partaking in cause marketing can increase sales (Solomon & Rabolt, 2004). Building brand loyalty is crucial to business these days and is a way the brand can contribute to a positive environmental impact (Textileexchange.org, 2014). Carrigan and Attalla (2001) come to the conclusion that if a consumer has an established loyalty with a certain product the consumer said it would be difficult to stop buying it.

Unfortunately, unethical companies are supported by consumers due to lack of education, competitive pricing, or the consumer is not emotionally connected to the cause. Results from a survey showed that consumers were uninformed about corporations acting irresponsibly, ending result was that 18% of participants could list firms that were acting irresponsibly and 26% could list corporations acting responsibly (Dragon International, 1991). Continual research said consumers do not actively boycott companies because they do not feel informed enough about the fashion brands' ethical behavior (Joergens, 2006; Pickett-Baker & Ozaki, 2008), overwhelmed by the amount of information or cannot afford to (Carrigan & Attalla, 2001). This is where cost again becomes so important.

4.522 Incorporation of Organic Cotton

Smart business strategies can help with the transition of organic cotton. Different retailers have to deal with acquiring organic cotton in the most profitable way that complements their business structure. Business strategies will vary depending on the size of the retailer, their product, and their consumer demographics. For the small-scale retailer Hessnatur (a European retailer) selling exclusively organic cotton apparel offers a

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smaller selection of styles to protect the profit margin (Illge & Preuss, 2012). This business strategy reduces the variety of garments offered which curb the cost of design and other garment production costs to offset the price premium (Illge & Preuss, 2012; Patagonia, 2006). The large-scale retailer, H&M, utilizes economies of scale to purchase and sell large amounts of organic cotton. H&M, the pioneer of this vertical retail structure, uses the buy-in-bulk strategy to maximize profit. This system allows the retailer to sell the clothes at low prices by reducing middlemen, producing large quantities, and having a streamlined distribution process (Illge & Preuss, 2012).

Continually monitoring consumer needs and the market provides companies with educated business decisions. Companies like H&M have found success by diversifying their products and blending cottons while other companies have increased sales through switching entirely to organic cotton. Patagonia is one of the most prime examples of company that completely switched to selling organic cotton in the summer of 1994 (Patagonia, 2006), and their sales increased by 25% (Sathe & Crooke, 2010).

4.523 Pricing the Organic Cotton Garment

There are different marketing approaches and strategies retailers can use to combat the challenge of a price premium. The price premium that is often attached to eco-fashion is so significant that Chan and Wong (2012) reported that it affects the relationship between store-related attributes and eco-fashion decisions. Coop Switzerland sold over one million organic items at the same prices as the alternative, the company giving credit to their marketing strategy (Myers & Stolton, 1999). Other strategies to overcome the hurdle of cost can be the blending of conventional and organic cotton to reduce cost and temporary price subsidies (Myers & Stolton, 1999).

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Marketing to consumers that are less concerned about price, or more concerned with eco-friendly products lessens the importance of the cost convenience factor (Myers & Stolton, 1999). Otherwise, to combat with the higher cost of eco-fashion marketers can highlight the other qualities of the garment (Meyer, 2001). Retailers increase sales by sharing the environmental information through marketing to “increase the importance of ecological compatibility” (Roberts & Bacon, 1997). An example of this can be seen at H&M, where they offer pamphlets about their organic cotton program. Changing the way a consumer sees the product is to change their beliefs through more marketing and education (Roberts & Bacon, 1997). A liberal return policy would persuade consumers of the quality and worthiness of the added cost. This idea comes from the research by Moorthy and Srinivasan (1995) that showed rebates and money-back guarantees helped move the inventory of the higher priced green products.

4.524 Marketing/Labeling

Organic cotton garments face the obstacle of green washing (Cotton Incorporated, 2008; Tompkins, 2008). Research suggests that consumers obtain information about the production standards and ethics while constructing the garments they purchase from the label on the product. This passive flow of knowledge “suggests that consumers are passive ethical shoppers rather than active consumer ethicists” (Carrigan & Attalla, 2005). Confusion has arisen with consumers over the marketing words “organic” and “sustainable” (Ross, 2006). The lack of clarity around these words creates uncertainty and confusion, reducing the importance and meaning the label represents to the consumer (Yan et al., 2012). A clear and concise uniform system of labeling is essential to increasing environmental awareness through green marketing, which can have a

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significant positive influence on the eco-fashion industry (Ochoa, 2011). Research suggests that the information presented on a label alters consumer decision making and overall thought processes while purchasing clothing (as said from, Chen & Wei, 2012).

Recently, the Federal Trade Commission has revised the green marketing guide to combat the problem of green washing (Cotton Incorporated, 2008). Global Organic Textile Standard also increased effectiveness with its labeling that is credited to a growing membership, unified labeling, and creating a system standard for certified organic cotton. Facilities carrying GOTS certification recently experienced an 11% increase in 2012, bringing the total number of facilities to 3,016 (Organic Trade Association, 2014). The increase of certified facilities is due to the rising awareness and standardization of certified textiles and an increase in transparency (Organic Trade Association, 2014). “Increasingly, more consumers are looking for various green products in the market” (Lin, 2010). Businesses can benefit from selling the eco-friendly option when they can clearly communicate the sustainable practices of their company (Yan et al., 2012). With an increase in clear organic marketing consumers can be educated and support the products with confidence.

4.525 Eco-Fashion Appeal

Clothes represent fashion, taste, style, and personality. Organic clothing faces the challenge of not being able to keep up with the trend (Illge & Preuss, 2012). Organic cotton garments in the past have been limited in style and colors, which hinders the ability to have mass appeal. This past trend contributes to the initial weak growth of organic cotton garment market in the 1990’s. Trend-setting customers are the innovators that make up an estimated 16% of the population. They possess strong opinions and

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express themselves through fashion (Morgan & Birtwistle, 2009). The absence of captivating this part of the population limits fashion ideas and trend exposure to the rest of the population.

There is a knowledge gap within the green fashion market, “producers and designers still lack knowledge of what the consumer desires and values in the eco-fashion field” (Niinimaki, 2010). When Esprit decided to experiment with an organic product line in 1992 it failed and the company contributed this to organic cotton being a fad with limited colors. Consumer got bored and Esprit was not able to keep up with the changing trend (Sathe & Crooke, 2010). Continually advancements are being made in eco-fashion and organic cotton can be substituted were conventional is used with no noticeable difference.

Research has showed that even when consumers care about the ethical practices of a company, they are not willing to sacrifice price, value, and quality (Carrigan & Attalla, 2001). Kirsi Niinimaki (2010) advocates that the designing and production part of fashion needs to take initiative and responsibility to create products for the consumer’s desires, needs, and values. “It seems that the effect of ethical issues on consumers purchasing behavior is relatively low because respondents cannot avoid acting unethically when purchasing clothing which refers to low or no availability of fashion that suits their aesthetic needs” (Joergens, 2006). Solomon and Rabolt (2004) agree with the previous statement, “that in the clothing industry, fashion and trends lead consumer choices.”

Image and eco-fashion tend to be in direct conflict with each other, designers in eco-fashion find that the green image can stand in the way of being fashionable (Illge &

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Preuss, 2012). “The more weight they put on issues such as eco-materials and the less important is the need to renew their appearance” (Niinimaki, 2010). If garments were made with high quality materials, adding value and meant for a longer closet life span, then the disposal fashion mindset could be reversed slowing down the cycle of fashion.

Physical attributes of a garment are significant to the consumer’s purchase decision. The organic cotton garments market has seen expansion because retailers identified the lack of trend they didn’t incorporate into the garment with the initial launch, now retailers have been successful when they addressed this oversight. With technological advances and an increase of emerging eco-designers the organic cotton garment has a stronger future.

4.526 Consumers Lack of Education

Lack of consumer education and awareness has shielded the conventional cotton industry controversy and pressure from environmentalists about their irresponsible and exploitive practices. Increased access, education, and awareness to consumers about the environmental impacts and social impacts caused by conventional cotton production will help stimulate change in consumer demands and behaviors globally. Unfortunately, the average consumer is not aware of the resources, pollution, and poor conditions built around the construction of their clothing due to the geographical disconnect between the producer and consumer. The developed societies that are responsible for consuming clothes that, “knowledge and responsibility are so diffused among economic actors that no one really feels responsible” (as said by Heiskanen & Pantzar, 1997).

Research has shown that educated consumers are more likely to make an organic cotton purchasing decision based on environmental concerns, which is a trend that has

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been highlighted in studies on multiple organic products and consumer behavior (Butler & Francis, 1997; Birtwistle & Moore, 2007; Kim & Damhorst, 1998; Hawley 2006; Lin, 2010; Montoro et al., 2006; Ogle, Hyllegard, & Dunbar, 2004; Phau & Ong, 2007; Staikos & Rahimifard, 2007). These consumers are also willing to pay more for organic cotton garments based on environmentally motivated reasoning (Casadesus-Masanell et al., 2009). Educated consumers who have an understanding of environmental and ecological impacts caused by humans usually chose to purchase garments that were shown to have a reduced carbon footprint (Roberts & Bacon, 1997). Previous focus groups and studies have hypothesized that the small size of the organic cotton market is due to the lack of media attention on the harmful production methods used by conventional production methods along with the convenience of fast-fashion purchases (Joergens, 2006; Morgan & Birtwistle, 2009).

Consumers are not fully informed on the true cost of their garment beyond the retail price. The environmental impact, socioeconomic exploitation, and risks to communities associated with conventionally produced garments need to be considered when making a clothing purchase (Myers & Stolton, 1999). According to a survey conducted by Butler and Francis in 1997, 90% of consumers polled admitted that they did not consider environmental impacts associated with the production of the clothing that they purchased. 75% of people polled; in a UK study knew little to nothing about the environmental issues associated with the fashion industry (Moral Fibre, a Beginner's Guide to The UK Market, 2005). While studies have consistently shown significant numbers of consumers that lack awareness and education about environmental issues, 75% of those that admitted they knew nothing stated that they wanted to learn more about

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the damage caused by their clothing (Fashion Goes Green High-Street Retailers are Rushing to Introduce Ethical Clothing Ranges, 2006; Your M&S, 2007).

In the end, a company has to weigh the tradeoff between economic performance and environmental conservation (Illge & Preuss, 2012). They, “may create a happy customer in the short-term, in the long run both consumer and society may suffer as a direct result of the marketer’s actions in “satisfying” the consumer” (Carrigan & Attalla, 2001). Many companies have made organic cotton profitable and the more that do, will increase the size of the organic cotton market, reducing risk, and in turn encouraging a market shift beneficial to both people and the environment.

Chapter Five

CONCLUSION

5.1 Introduction

Research shows that conventional cotton production methods rely on unsustainable practices and procedures that are detrimental to the environment, regional biodiversity, and available natural resources which negatively impact the health of citizens residing in the associated farming communities. The negative impacts from conventional cotton production methods increase the rate of global climate change, contaminate local water supplies, consume excessive amounts of natural resources, pollute the atmosphere and water table, deplete limited nutrients available in arable farmland, and exploit the needs of impoverished communities for increased profit margins. In order to responsibly produce the amount of cotton fiber needed to meet consumer demands, there needs to be a shift from the current “resource-intensive practices to knowledge-intensive practices” within the conventional textile industry (Textile Exchange, Cotton Briefing, 2011). “Organic cotton should be promoted as one of the means of achieving environmentally, economically and socially sustainable cotton production and processing systems” (Rafiq, 2012).

5.2 Production of Cotton

Harmful chemical additives, flood irrigation techniques, and the lack of crop rotation in order to fertilize the soil all contribute to the release of significant levels of nitrogen into the atmosphere and soil contaminating the water table and increasing the rate of climate change. “Rising costs of inputs, consumer interest, demand from the public, decreasing pesticide effectiveness due to greater resistance in target organisms,

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and impacts of environmental regulations, including pesticide regulatory pressures, have stimulated interest in cotton production systems which do not require conventional synthetic pesticides, fertilizers, or defoliant inputs” (Myers & Stolton, 1999).

Sustainable organic cotton harvesting methods are successfully being implemented in farms, producing cotton through environmentally friendly practices that have high quality output and is being consumed for organic cotton garments. A cotton farm that transitions to organic production standards gains access to education, grants, potential corporate partnerships, and assistance in implementing a long-term sustainable and profitable business plan, without the fear of financial devastation due to crop failure from a bad harvesting season. Crop rotation methods provide farmers with additional sources of income, and the labor intensive harvesting process increases the amount of jobs available to residents of the impoverished cotton farming community (Organic Trade Association, 2014). Promoting change within the conventional market can provide profitable investment opportunities for innovative entrepreneurs; clothing companies that want to improve their green image, and farmers in developing nations who are afforded the opportunity to improve the standard of living for their families and communities.

Organic cotton farming produces significant profitable yields once harvested at the end of a growing season. The small portion of the cotton market that consists of organically produced fiber provides a substantial area of growth that can be achieved through the transformation of previous conventional farms. Developing agricultural countries are starting to see the potential for growth, as well as the increased price levels paid for organic cotton, and are capitalizing on this rapidly growing market. Countries in West Africa doubled their production levels in 2007-2008 (FAO, 2009), and as public

awareness and consumer demand increase other regions will inevitably embrace the environmentally conscious practices.

5.3 Economics

The current conventional cotton market is highly reactive to inflation and recessions at both national and global levels. Global cotton production trends remain relatively stagnant when viewing long-term trends and future trends predict stagnation with small periods of slow growth below the rate of global inflation. This market outlook identifies the unsustainable business model of the current conventional cotton market, and investors need to adapt in order to alter future trends. Since the emergence in the early nineties of organic cotton identified as a niche product within the cotton market, new opportunities for growth, change and progress have become available. In the relatively stagnant cotton market, organic cotton has consistently shown significant levels of growth that does not seem to react to market fluctuations like its conventional counterpart.

The levels of organic production and consumer demand continue to rise at an increasing rate due to expanding consumer awareness and transparency within the garment industry. As research and technological innovations continue, larger organic cotton operations (economies of scale), motivated by grants and subsidies from the host nations in order to promote environmentally sustainable farming (Myer & Stolton, 1999).

Retailers entering the organic cotton garment market can take advantage of the niche marketing strategy (Lin, 2010). Companies transitioning into this market can take advantage, while adapting new management structures that reduce waste and reduce production costs (Myer & Stolton, 1999). Organic cotton growth has been credited to the

increase in green consumerism and the retailer's expansion of organic cotton use (Casabona, 2010).

5.4 Consumer Behavior

Educating the public about organic cotton is important to improve the health of farming communities and to reduce the degradation of the environment. Once consumers are motivated to purchase products that meet the organic cotton standards, the fashion industry will be forced to incorporate these products into their clothing lines which will increase consumer demand, and this process will continue to go back and forth in a domino like effect. Continual education, public awareness campaigns, and ongoing innovative research to improve efficiency within organic cotton production methods will encourage the expansion organic cotton products from a small niche market within the industry to an emerging high quality product in high demand for both producers and consumers. Once consumers are motivated to purchase products that meet the organic cotton standards, the fashion industry will be forced to incorporate these products into their clothing lines.

Ethics is another fundamental piece credited to the increase in organic cotton consumption. The increase in price, limited availability, and convenience prove conventional cotton garments to be a strong competitor. Ethics is one of the factors behind the consumer's decision, "it is not enough to possess the prerequisite knowledge and ability to make efficient consumer decisions, and one must also act according to that knowledge: (Carrigan & Attalla, 2001). Producers, consumers, and companies behaving ethically will bring about the needed change, as the organic cotton garment has a more positive form of production.

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Comprehensive analysis of previous research on consumer behavior influences, combined with data collected from the Seattle survey provides a unique multilateral perspective for eco-fashion minded companies to capitalize key demographics in order to maximize sales and market growth. The research scope is limited to consumer behavioral analysis in the retail setting, because this is the area that is most easily manipulated, targeted, and reactive to changes in marketing and merchandise strategies. When consumer demand for organic cotton grows, the amount of farms producing organic cotton products will increase in order to appease the desires of the consumer. If implemented properly and carefully, organic cotton clothing companies can develop a profitable and sustainable innovative and dynamic business model that is responsive to the delicate balance between the influencing factors in consumer behavior. A successful strategy to maximize market penetration and growth would incorporate an aggressive reactive pricing strategy for the organic garments based on the observed consumer behaviors associated with the previously identified SRA, GRA, and ERA.

There has been an increase in the amount of ecological consumerism where individuals make purchasing decisions based on environmental responsibility as the driving influential factor (Kim & Damhorst, 1998; Lin, 2010; Hanas, 2007; Ottman & Martin, 2009). Consumers want to purchase products from a company that behaves ethically, and has a reputation as an environmentally responsible company that is both sincere in its commitment and reliable (Beard, 2008; Myers & Stolton, 1999; How Green Are You?, 2006). “Sustainability sells –instead of buying an anonymous product, more and more consumers are looking for healthy, environmentally friendly clothing whose production is transparent and guarantees fair labor practices” (Organic Cotton, 2013).

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Matthew Reynolds, the CEO of Indigenous Designs, released a statement reporting a 30% growth in sales from 2002 to 2003 attributed to organically produced garments (Wilson, 2004). The environment, local communities, and global market will continuously improve concurrently with the growth of the organic cotton industry.

“Consumers do not wish to be inconvenienced, and ethical purchasing will only take place if there are no costs to the consumer in terms of added price, loss of quality or having to “shop around” (Carrigan & Attalla, 2005). Price is continuously identified as the main deterrent to increased consumer demand for the organically produced garments. Research has shown that increased awareness and consumer education promoting transparency in the industry will increase consumer acceptance of necessary price premiums that are needed in order to offset additional costs. The short-term cost of sustainability is needed in order to insure the long-term quality of our planet.

Morgan and Britwistle (2009) define personality traits attributed to specific consumer behavioral practices and conclude that consumer-purchasing behaviors are susceptible to change through increased education and awareness. Consumers in wealthy nations need to be made aware of the impoverished conditions, forced labor, reduced life expectancies, and child labor that is needed in order to provide them with the cheaper conventionally produced garment that they demand. As the consumers become aware of the issues with conventional production methods, demand will increase, which will result in the acceptance of sustainable production methods throughout the fashion industry.

The Seattle based survey conducted for this paper provided data that, once analyzed, confirms previously published studies that identified the committed consumer and health conscious consumer as the individual who is most receptive to eco-fashion

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sales and marketing strategies. The Seattle demographic is made up of consumers that are known to be progressive, health conscious, outdoor enthusiasts who support environmental responsibility and organically produced products. The results did not produce any patterns, relationships or trends between income levels and eco-fashion purchasing decisions, providing supportive data for previous study findings that report consumer purchasing decisions in eco-fashion are based on ethical decisions not on affordability.

5.5 Summary

Clothing companies such as H&M and Patagonia have been leading the campaign to promote change within the industry. “H&M’s aim is for all cotton in our range to come from sustainable sources by 2020 at the latest. Since 2006, H&M has increased the amount of organic cotton used in production by 17,000% from 50 to 8,500 metric tonnes and they pledge to continue this increase in volume by 50% annually (Illge & Preuss, 2012).

Retailers have begun to see the need to commit to a more sustainable business model to insure long-term growth and success. Companies already transitioning to sustainable production methods are positioning themselves into an area where they will be considered as the industry leaders in sustainability. These industry leaders are developing a key infrastructure that is resilient to market shocks resulting from limited resource availability. Countries, corporations, and individuals are increasingly making public statements identifying their commitment to environmentally responsible standards, reductions in emissions, and other sustainable practices that appeal to the “environmental consumer” (Organic Trade Association, 2014). “Apparel brands are responding to

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increased acceptance of the organic message among consumers” (Ross, 2006).

The current structure of the conventional cotton industry does not support long-term sustainability, and a transition to alternative production methods is essential in order for a company to maintain success and productivity in the future. The market transition from conventional to organic production methods will be a slow consistent and observable shift perpetuated by increasing consumer demand, decreasing available resources, and public outcries due to the excessive environmental damage caused by the conventional production methods. Marketing strategies promoting growth in the organic cotton industry need to appeal to consumer desires, not guilt, as well as increased public awareness and education in order to create transparency of the entire production supply chain of a cotton garment. This consumer-based strategy is designed to increase demand for organic products, which is what drives the direction of the fashion industry.

The organic cotton market has continuously produced significant levels of growth and the outlook of this industry does not show any signs of slowing down in the future. This expansive growth outlook is supported by studies conducted in consumer behavior, agricultural trends, projected consumer demands, and historical trend analyses of the growth patterns for cotton garments produced in the fashion industry. Organic farming is an environmentally and socially responsible production method that provides a sustainable and profitable harvesting alternative that also combats climate change, water scarcity, and the exploitation of developing impoverished farming communities (Textile Exchange, Turkey, 2013). “Consumers, buyers, national governments and industry associations all have their role to play in helping organic cotton reach more retail shelves” (Hulm, 2008).

Appendix A

Organic Cotton Initiatives and Organizations

Better Cotton Initiative:

The Better Cotton Initiative offers informative tools that look at the supply chain to better assist in the reduction of waste and improve of the system used by small business buying organic cotton from farmers.

Brazilian Association of Cotton Production (ABRAPA):

The organization of Brazil aiming to unify cotton production standards within the country. The Cotton Program Manager (ABR) is the sustainability protocol used to grant certification to organic cotton.

The Organic Cotton Council:

Formed in 1996, is a national organization that partners with all involved parties to unify the sectors to organize and improve efficiency, to provide a strong voice for legislation and policy issues, increase public awareness, and increase sales in the industry

Global Textile Exchange:

GOTS was formed in 2006 to reduce the competition and unify four different associations and unify the standards for organic cotton globally. They are one of the lead providers of certification for organic cotton globally.

Textile Exchange:

Textile Exchange is an international non-profit organization to inform, lead, and connect the industry for a more sustainable textile industry. Their vision is to “inspires and equips people to accelerate sustainable practices in the textile value chain. We focus on minimizing the harmful impacts of the global textile industry and maximizing its positive effects.” By Means of three elements: We help embed sustainability into evolving business and supply chain strategies.

Organic Exchange:

Organic Exchange is a nonprofit organization focused on promoting the growth of the organically grown cotton industry through connecting suppliers with consumers. Their focus is to increase the size of organic cotton production to better social and environmental challenges.

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Appendix B

Seattle Survey

Gender:

Female Male Other

Personal Annual Income:

Less than \$30,000 \$30,000-60,000 \$60,000-90,000 \$90,000-120,000 \$120,000 or Greater

Age:

25 or younger 26-35 36-45 46 or greater

Family:

Have Children No Children

Highest Education Level Completed?

Less than High School High School/GED Associates Bachelors Graduate or higher

Please circle the number indicating the degree of importance as it pertains to you. Let the number 1 represent Not Important and 5 represent Very Important.

Not Important / Very Important

Clothing Attributes

Design appeal	1	2	3	4	5
Currently trendy	1	2	3	4	5
Quality	1	2	3	4	5
Price	1	2	3	4	5
How well the garment fits	1	2	3	4	5

Clothing Store-related Attributes

Brands environmentally friendly practices	1	2	3	4	5
Customer service	1	2	3	4	5
Convenience	1	2	3	4	5
Stores design and atmosphere	1	2	3	4	5
Brands good reputation	1	2	3	4	5

Environmental Attributes

Garments that use less and contaminate less water during manufacturing	1	2	3	4	5
Clothes that have minimized pollution during construction	1	2	3	4	5
Clothes that have more sustainable manufacturing methods	1	2	3	4	5
Clothes that use less energy during production	1	2	3	4	5
When given a choice, I choose the garment less environmentally harmful	1	2	3	4	5

How much more are you willing to pay for organic cotton clothing?

Nothing 1-4% 5-9% 10-14% 15-19% 20-24% 25% or more

Appendix C

Glossary

Biodiversity: the variability of all living organisms in a habitat.

Boll: the seed-vessel of a cotton plant

Bollworm: several species of Lepidoptera that feed on cotton balls

Cash-crop: income-earning crops grown for exportation and local consumption.

Cause Marketing: Companies acting socially responsible and charitable within their communities as a way to enhance their image.

Certified cotton: cotton that has received certification that the production process followed certified organic production.

Compost: decomposed material and/or animal waste used to put nutrients back in the soil.

Conventional agriculture: the intensive farming process that depends on synthetic fertilizers and chemicals.

Cotton bale: A compressed bale of cotton lint after the ginning process, with the universal weight being 220 to 225 kg with a density of 448 kg/m³.

Cotton fiber: is the cotton lint that is separated from the shell during the ginning process.

Cotton gin: the machine used to separate cotton fiber from the seed shell

Cotton lint: “the fiber that develops as an extension of cells in the walls of developing cotton seed; product that results from the separation of cotton fiber from the cotton seed in the ginning process” (Myers, 1999).

Cottonseed: the seed of a cotton plant.

Defoliants: chemicals used to remove leaves from the plant before harvest

Eco-fashion: a segment of fashion that uses sustainable fiber and/or recycled materials

Eco-label: the label given to a product by a third party that speaks to the product produced with more sustainable methods.

Eco-textiles: products made with efforts to reduce environmental impacts.

Environmentally responsible: actions taken to reduce negative environmental impacts.

Genetically modified: the genetic manipulation of an organisms genome.

Ginning: the process that uses machines to separate the cottonseed from the cotton lint and clean it.

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Greenwashing: refers to a marketing ploy to sell products based on the quality that it is produced with environmental consciousness, when in actuality it is not.

Herbicide: synthetic chemicals used in farming to kill unwanted plants.

Insecticide: synthetic chemicals used in farming to kill unwanted insects.

Intercropping: secondary or supplementary crops planted between the rows of the primary crop

Micronaire: cross-section of the cotton fiber

Monoculture: growing one type of crop year after year in the same soil.

Monocropping: (See Monoculture)

Niche market: a small specific subset market within a larger one

Nitrogen fixation: the process where nitrogen (N_2) in the atmosphere is converted into ammonium (NH_4^+).

Organic agriculture: is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved. \

Pest treadmill: the continual application of pesticides that kills pests and pest controlling organisms and creates dependency. With every application the pest outbreak can increase as the pests build up resistance and their predators are killed off, causing the farmers to become more dependent and use larger quantities of pesticides.

Pesticide: chemicals used to in farming to kill pests.

Pesticide resistance: tolerance developed by pests rendering the pest repellent product useless.

Plastic Mulch: plastic made mulch that acts as a barrier to serve the same purposes as traditional mulch.

Price premium: take the commodity price (this is usually the price quoted in the country of origin or on the commodity market at a set time) and add a percentage increase (often called a 'price premium'). The objective of the price premium is to help both parties arrive at a fairer price; one that is more likely to reflect the cost of production and viability of the business." (Textileexchange.org, 2013).

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Rotation: changing the species of crops after growing cycles to protect soil quality and prevent pest outbreaks.

Risk: the potential of a loss as weighted against a potential gain.

Salinization: an increase of salt in the soil.

Social Responsibility: a company's effort to go above the legal minimum and do what they can to benefit society.

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