

**Sustainable Cotton & Gap Inc.: A Case Study**  
**Sarah McGovern, University of Connecticut, Stamford CT USA**  
**Timothy J. Dowding, University of Connecticut, Stamford CT USA**

**ABSTRACT**

*This paper examines Gap's corporate strategy of sustainability in the cotton used in its product line of clothing. It discusses the value chain of cotton, from its initial harvesting and transformation into fabric before being finally processed into clothing. This paper will talk about the major economical, social and environmental issues surrounding the sustainability of cotton and what Gap is doing to ensure that future generations will be able to enjoy their products as much we do today.*

**INTRODUCTION**

The concept of adopting sustainable business practices is becoming increasingly popular amongst the global economy, but the concept of sustainability is very abstract and tends to vary by industry and by company. The main goal is to explore “the relationship among economic development, environmental quality, and social equity”, and to maximize all three components while maintaining a balance between them [1]. Sustainable practices can not only help in preserving the economy, the environment and society, but it can also lead to a significant cost savings for most organizations, which is why this is gaining popularity. In order for sustainable goals to be achieved, this balance needs to occur across a company's supply chain and maintain the integrity of the organization. Gap Inc. is an example of one organization that is taking their sustainability efforts very seriously and applying them across their supply chain. This is particularly true for their use of the raw material cotton and the practices by which it's manufactured.

**Cotton**

Cotton is an ancient plant, dating back over 7,000 years. The first written record of cotton was reference in the 3<sup>rd</sup> century B.C. by the Army of Alexander the Great where it was seen being widely used in India. It was brought back to the Mediterranean countries and quickly spread throughout Europe, where the plants were often described as “the fleece of tiny lambs growing on trees” [2]. The need and desire for cotton grew over time and it was one of the driving forces behind the many explorations in the 15<sup>th</sup> and 16<sup>th</sup> centuries.

After the British settlement in America, colonists began growing cotton, but only in moderation mainly due to difficulties in harvesting and restrictions put in place by the British government prohibiting competition with their crops. These restrictions were lifted at the end of the Revolutionary War in the late 18<sup>th</sup> century, which was followed by two important events in cotton manufacturing. [2]. First, was the opening of the country's first cotton spinning mill in Pawtucket, RI by Samuel Slater, which was said to launch America's Industrial Revolution [3]. This, along with the proceeding mills Slater opened, drastically improved the efficiency of how textiles were made and increased the demand for cotton fiber.

The next hurdle was to find a way to harvest the cotton fibers more efficiently. Cotton was being picked by slaves and the fibers were being separated by the seeds by hand. With the demand for the fibers increasing, this method couldn't keep up. Eli Whitney developed the cotton gin in the late 18<sup>th</sup> century, which separated the fiber from the seed and could clean “50 times more cotton fiber in one day than a human” [4]. The cotton gin greatly increased cotton production, which led to cotton becoming one of the largest crops in America.

Today, cotton has become a global industry. The United States continues to be a leading exporter of cotton, followed by Central Asian and Francophone African countries, while the leading importers of cotton fiber are China, Turkey and Pakistan [5]. As the plant has spanned the globe, cotton has been found to have other uses beyond textile fibers, including producing cottonseed oil for cooking and fuel, and using leftover hulls as feed for livestock

[2]. These alternative uses have increased its value on the commodities market, the demand amongst manufacturers and the complexity of its value chain.

As the global demand continues to grow, the need to preserve the fibers and harvest as much as possible becomes an increasingly important necessity. To achieve this, cotton farmers have taken to using large amounts of insecticides, which can be extremely hazardous to human and animal health. Farmers are also using nitrogen synthetic fertilizers, which can cause groundwater pollution and contribute to nitrogen emissions, which can lead to an increase in global warming. During the manufacturing process of both cotton to textile and textile to clothing, many hazardous materials and chemicals are used creating large amount of toxic wastewater, which is disrupting the aquatic ecosystem in the area of these factories. Because of this negative impact on the health of society and the environment, there are a growing number of apparel and textile companies, such as Gap, Inc., that are taking interest in reduced pesticide and organic cotton [6].

## **THE COTTON VALUE CHAIN**

The cotton value chain has numerous levels and complexities, and it affects all areas of sustainable practices. Traditional farming and cultivation practices have a huge effect on both the environment and the people farming the crops. Pesticides and insecticides used for harvest can harm not only the cotton crops, but also the surrounding crops since the chemicals travel through the air and the groundwater. These chemicals also have a negative impact on the ecosystem and society in the surrounding areas. Moving into the textile and apparel production, water and air quality continue to be an issue as the pesticide treated cotton is transformed into textiles. Working conditions in many of these factories are poor and they are often considered to be sweatshops. Because many of these factories are located in remote areas far from retail locations, transportation to these locations also has a significant environmental impact. Finally, retail locations need a complete design overhaul to become more sustainable. Lighting, building materials, plumbing and heating are all areas that can have better, more efficient options to lessen the environmental impact of these stores. Working toward LEED Accreditation should be an optimal goal for many retailers.

### **Cotton Farming & Processing**

Traditional farming of cotton includes the use of pesticides and insecticides, which can contain sodium nitrate and other “organophosphate nerve poisons like DEF, Folex and paraquat” [7]. These poisons are mainly used to kill crop-killing pests and to facilitate a process known as defoliation, which causes the leaves to fall off of the cotton plants. Defoliation has been critical in attaining high yield crops because it dries out the fields to allow faster harvesting after rain, as well as making harvesting easier by improving the efficiency of the pickers in the field. But if done too early, defoliation can kill immature crops since it halts all fiber development, leading to entire crops being wasted [8]. While this process might benefit the farmers’ bottom line if done correctly, defoliating can have many negative environmental and societal impacts.

During defoliation, chemicals are delivered to the crops via crop duster planes, so not only are the chemicals reaching the cotton plants, but also they are entering the air and drifting across the region. Cotton is often planted near other vegetable crops, vineyards and residential areas, which mean these pesticides are getting into different food sources, the local water supply and the air that nearby residents are breathing [7]. According to the World Health Organization, an estimated 350,000 people globally die each year from unintentional chemical exposure such as those used in pesticides [9]. The workers harvesting the cotton are at an increased risk to chemical exposure by being in close proximity to the treated cotton. Next, when cotton is brought to the gin mills, the chemicals are reintroduced into the air as the fibers and seeds are separated from each other, which causes a dangerous situation for the factory workers. Furthermore, these chemicals have been known to cause skin irritation for the consumer purchasing the clothing.

Organic cotton farming is on the rise and is forecasted to grow between 20 and 40 percent through 2011 [10]. Strict regulations prohibit the use of chemical pesticides in growing the crops and require farmers to use various natural methods of controlling pests and defoliating. Natural disease organisms and predators, such as spiders and mites,

are used to kill cotton pests, and defoliation is done by using flames or waiting for frost to harvest [11]. A recent study conducted by Greenpeace concluded that in South India, cotton farmers using organic methods are 200% more profitable than those farmers using genetically engineered cotton seeds, which is otherwise known as Bt cotton. Bt cotton farmers are using up to 26 different pesticides in their crops, which can have serious environmental impacts and even cause cancer. This study also showed that “organic cotton actually show greater resistance to pests,” meaning that the use of these harmful chemicals is unnecessary [12]. As more research is done, it will continue to be seen that organic cotton farming practices not only help the environment and society by not using chemicals, but that they stimulate the economy as well.

## **Textile & Garment Manufacturing**

Textile and garment manufacturing has never been a glamorous industry. Textile factories were born in Massachusetts in the late 18<sup>th</sup> century after the creation of the cotton spinning mill and quickly spread throughout the country. This sparked the industrial revolution in America, and with that came the creation of labor unions. Workers had been fighting for better working conditions, as many factories had and continue to have sweatshop conditions, and the unions helped to regulate the working conditions in the factories. In the 20<sup>th</sup> century, a shift occurred to overseas production of textiles, mainly to Asia [13]. This was due to cheaper labor and less regulations on working conditions in the factories.

Manufacturing denim in particular has extreme environmental and social impacts as well. The process of creating denim begins with plain, white cotton and dyeing it in various chemicals to achieve its deep, indigo blue color. This process produces a large amount of wastewater, which is typically not properly treated before being released into the local water supplies.

A prime example of the negative impact of denim manufacturing is in Xintang, China, which is home to a large number of factories, including clothing. Said to be the “blue jean capitol of the world,” 200 million pairs of denim jeans are produced there each year, which is creating large amounts of industrial waste. The Pearl River runs through Xintang and has long been considered to be the “lifeblood” of this region, but the river is becoming increasingly polluted and even turning black in some areas due to massive amounts of untreated wastewater and other denim waste that is being poured into it from the local factories. The impact on the environment can already be seen on the shores of the Pearl River through massive amounts of sludge and waste, much of which are scraps of denim. The larger impact is the effect this will have on the ecosystem as a whole. Local residents continue to eat fish from the river and it’s just a matter of time before health issues start appearing like they have in other areas of China that are experiencing the same levels of pollution [14].

New water savings techniques are emerging in denim production, which hold promise in revolutionizing the industry. Two companies in Europe have come up with a few of these new technologies. A chemical company in Switzerland, Clariant Advanced Denim, has developed a method of textile dyeing called Pad/Sizing-Ox, which reduces the amount of dye used from ten boxes to one, and uses 92 percent less water, 30 percent less energy and an 87 percent reduction in cotton waste savings compared to traditional dyeing methods [15]. Another dyeing method that uses no water has been introduced by Netherlands based DyeCoo Textiles Systems. This method is called DryDye, and uses CO<sup>2</sup> to deliver the dye to the fabric. Heated CO<sup>2</sup> loaded with dye penetrates fabric much deeper than traditional methods. This revolutionary new technology contributes to a more sustainable environment in terms of “water consumption, energy consumption, CO<sup>2</sup> emissions and waste disposal” [16].

## **GAP INC. – EMBRACING SOCIAL RESPONSIBILITY**

Gap Inc. believes that being a socially responsible company “means going beyond the basics of ethical business practices to embrace a broader, deeper responsibility to people and the planet” and they are committed to the simple principle of “do what’s right.” They have formed strong relationships with their stakeholders to collectively work together and achieve their goals, and have created strong corporate governance to support their progress. Standards have been set for their vendors, business practices, public policy and product safety to ensure quality in the product. Gap Inc. also encourages their employees to take an active role in supporting their initiatives, and to make decisions

that will ultimately make a difference. In narrow their focus to create the largest positive impact on the environment and society, Gap Inc. has chosen four main areas to concentrate on: supply chain, environment, employees and community investment [17]. This study will be focusing on two of the four areas.

## **Supply Chain**

Gap Inc.'s supply chain begins with the farming of raw materials, namely cotton [Figure 1]. They are looking at the impact that current farming and harvesting methods are having both environmentally and socially. Gap Inc. is working to incorporate organic cotton and other fibers into their product line to support this industry. In the summer of 2009, Banana Republic introduced the Heritage Collection featuring silk made from soy, hemp and organic cotton, with the hopes of incorporating style and sustainability. Gap, Inc. hopes to bring this to other brands, Gap and Old Navy, because of their larger scale market, but may hit a few roadblocks due to the increased price for these sustainable materials [17]. Unfortunately because organic farming is much more labor intensive and has a higher overhead, the end product is typically much higher, which can alienate many customers. Socially, Gap Inc. is working to eliminate the use of child labor to manual pick cotton in Uzbekistan. They are putting pressure on the Uzbek government to regulate these practices by partnering with other clothing manufacturers and the U.S. State Department to voice their concerns. Gap Inc. has also prohibited any of their vendors from using cotton sourced from Uzbekistan until they change their practices [18].

The supply chain continues into the factories and apparel manufacturers, where Gap Inc. has focused most of their attention. Gap Inc.'s efforts to improve factory conditions began in the mid-1990s beginning with "cut-and-sew" factories. Vendor Compliance Officers (VCOs) were established to monitor the working conditions and eventually partner with the management of the factories to educate them on acceptable management techniques and develop human resource systems. This allows the factories to improve their working conditions on their own, while having a support system is needed. By 2008, the VCOs were monitoring factories in over 50 countries, and they have played a crucial role in helping to reform how factory workers are treated and the conditions they work in [17].

Gap Inc. has gone as far as to develop a Code of Vendor Conduct (COVC), which outlines standards that factories must meet in order to work with Gap Inc. VCOs will conduct an initial audit of the factory to determine if they meet the standards. If approved, the VCOs continue to monitor the working conditions and the steps the factories are making towards improvement based on a 1 to 5 rating scale, with 5 being excellent. They then assist factories with low ratings to establish better efficiencies and take corrective action for any problems that may be occurring. Gap Inc.'s Supply Chain goals for the end of 2010 include increasing the number of 3 or higher rated factories they work with, ensure that 10% of the factories have established human resource management systems, and provide training for at least 75% of the factories on how to improve working conditions [17].

## **Environment**

Gap Inc. takes their commitment to sustaining the environment very seriously. They require all employees to do their part in supporting this cause and even involve their suppliers as well. To maximize the effectiveness of the work they are doing to conserve the environment, Gap Inc. is focusing on four main goals: calculating their environmental footprint, involving the entire company, championing grass roots advocacy, and partnering with external environmental groups [17].

In calculating their environmental footprint, Gap Inc. was able to get a grasp on the scope of their impact across all areas of the company. The assessment was broken into two phases. Phase I looks at areas of the company they control, such as retail stores, distribution centers, transportation systems and corporate offices. This focuses on how resources, such as water, electricity and waste, are being used at all of the aforementioned locations. Phase II looks at the factories that manufacture the apparel that Gap Inc. has less control over, but are easily influenced by the VCOs. The results of the assessment help Gap Inc. to set various goals, allocate resources and see where they stand in regards to current environmental regulations, which has led Gap Inc. to tighten their environmental focus in three areas where they can make the largest impact. It is called their ECO focus, standing for Energy Conservation, Cotton / Sustainable Design, and Output and Waste [17].

Gap Inc. participates in the U.S. Environmental Protection Agency's Climate Leaders program, which is an "industry-government partnership that works with companies to develop comprehensive climate change strategies. Participating companies commit to reduce their impact on the global environment by completing a corporate-wide inventory of their greenhouse gas emissions based on a quality management system [and] setting aggressive reduction goals" [19]. The program sets a goal for companies to reduce greenhouse gas emissions by 11% in five years. Gap Inc. exceeded this goal and reduced their emissions by 20% from 2003 to 2008. This was mainly achieved by replacing close to 16,000 light fixtures in their distribution centers to energy-efficient fluorescent bulbs. Gap Inc. continues to grow on this success by making changes in both their distribution centers and retail stores. Currently, store designers are assessing stores in all divisions in trying to work towards Leadership in Energy and Environmental Design (LEED) accreditation, which is the nationally known green building standard [17].

Sustainable product design is accomplished through many different channels and Gap Inc. has formed global partnerships to build momentum in this area. Gap Inc. became a founding member of the Better Cotton Initiative (BCI) to assist in their designs. The BCI is a non-profit organization that receives all of its funding from its members. Its main goal is "to make global cotton production better for the people who produce it, better for the environment it grows in and better for the sector's future" [20]. The BCI has set strategic goals through 2012 to develop Better Cotton practices worldwide, but there is still a long way to go in organic cotton farming and better practices for textile productions. According to the *Organic Exchange Farm and Fiber Report 2009*, organic cotton production grew by 20 percent, but the total only represents 0.76 percent of cotton production worldwide [21]. Hopefully with the help of the BCI, these numbers will continue to increase and more companies will step up to the challenge of creating sustainable products.

Reducing output and waste can be difficult for apparel companies because waste is introduced in every aspect of the supply chain [Figure 1]. Gap Inc. is making conscious efforts to reduce their waste and use resources more effectively. Recycling programs have been introduced in all corporate offices and retail stores and the amount of corrugated cardboard used for shipping has been reduced by 57,000 tons. Waste water from garment manufacturing has a huge negative impact on the environment, and Gap Inc. has become a member of BSR's Sustainable Water Group to try to help solve this issue. The goal of the Sustainable Water Group is to establish guidelines for textile manufacturers to reduce the amount of toxic materials found in their wastewater, which was accomplished in the late 1990s. A Clean Water program was formed in 2004 in addition to the COVC to audit and monitor wastewater practices of their manufacturers to ensure Gap Inc. is working with the most compliant companies. Most recently, Gap Inc. has included a strict policy that requires all new and existing suppliers to adhere to wastewater quality guidelines in order to do business with the company as part of the COVC [22]. Output and waste can be extremely detrimental to the environment, which is why two of Gap Inc.'s main goals for 2010 are creating new store-level and supply chain waste management initiatives.

## **GAP INC. – GREENING THE COMPANY**

All divisions of Gap Inc. have committed to "greening" their environmental impact and increasing their sustainability efforts. They recognize that everything they do has an impact on the environment and are using the results of the environmental footprint assessment to move forward with their efforts. For example, Banana Republic is taking an "eco-conscious" approach to their stores. All store floors are made with Forest Stewardship Council (FSC) certified wood, which comes from sustainable forests, and stockroom floors have tile made from 15% recycled material. They have also made the switch to recycled materials for most of their packaging materials, including shopping bags, shoe boxes and price tags. Old Navy has begun offering a clothing line of t-shirts and denim made from recycled materials, as well as stainless steel water bottles and reusable bags. They have also begun to embed their promotional flyers with wildflower seeds that can be planted and watered instead of thrown away [23].

## **GAP INC. – SUSTAINABILITY AUDIT**

To enhance a company's sustainability profile, it is necessary for them to conduct an internal sustainability audit to see where they are in their efforts and what improvements can be made. Refer to the Appendix II of the Boston Consulting Group's "The Business of Sustainability" Report for more information on the audit [24]. The following is Gap Inc.'s sustainability audit.

### **Framing the Sustainability Agenda**

1. Level 4: Gap Inc. has a clearly articulated corporate definition of sustainability and how it will affect their business. It is referred to as their Social Responsibility as their efforts encompass numerous social and environmental sustainability issues.
2. Level 4: Gap Inc. has identified four main areas of importance to focus their sustainability efforts: supply chain, environment, employees and community involvement.
3. Level 4: Gap Inc. has set yearly goals to accomplish their sustainability efforts, which are also broken out by the four focused areas.

### **Developing the Business Case for Sustainability**

4. Level 4: Gap Inc. has developed a clear business case for their sustainability efforts, and their stakeholders play a large part in making these decision. Most goals are set 2 to 3 years in the future.
5. Level 3: Gap Inc. has identified what their long-term goals are, but have not yet modeled them into their business plan. They seem to be focusing on what can be done in the short term and working towards those goals.
6. Level 4: Gap Inc. has met and exceeded their targets for their sustainability efforts, especially in regards to their reduction of energy emissions.

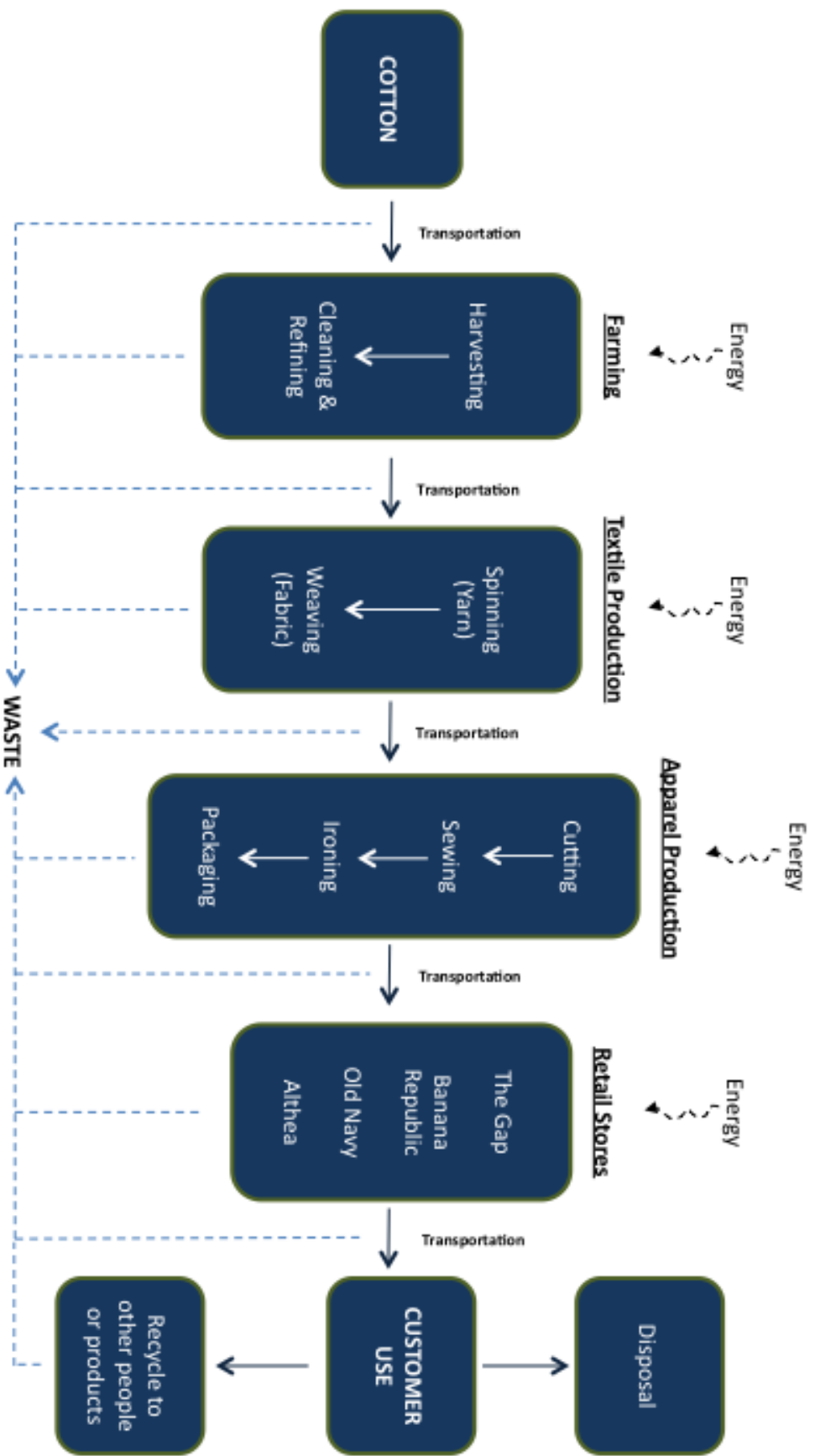
### **Executing the Sustainability Strategy**

7. Level 4: Gap Inc. requires all of their employees to participate in their sustainability goals. One example is the company wide mandatory recycling program they have instituted.
8. Level 4: Gap Inc.'s sustainability strategy is fully integrated in all departments of the company and each has their own goals to meet.
9. Level 4: Gap Inc. is committed to partnering with their stakeholders to move forward in their sustainability efforts and realized that they will not be able to accomplish their goals without them.
10. Level 4: Gap Inc. has put tools in place to accomplish their goals. Most importantly, they have created Vendor Compliance Officers to monitor the progress of the business they partner with to ensure their mission is upheld across the spectrum.

## **CONCLUSION**

In the last 15 years, Gap Inc. has made significant advances in improving their environmental and social sustainability efforts and continues to look towards the future. Gap Inc. has been making substantial strides towards adopting more sustainable business practices. There are numerous other practices they can adopt across the value chain to take the company to the next level of sustainability. For example, a logical next step for Gap Inc. to take with their denim line is to use new water saving techniques to produce denim. Gap Inc. has strong buying power in the textile and apparel market, and with this has the ability to be a leading force in sustainable business practices for the industry.

FIGURE 1: COTTON VALUE CHAIN FOR GAP, INC.



**FIGURE 2: GAP, INC. VALUE CHAIN IMPACT ON THE P3G MODEL**

	Raw Material	Farming	Textile Production	Apparel Production	Retail Store
People		Gap, Inc. is working with farmers to reduce the use of harmful pesticides	Gap, Inc. is working to reduce the amount of hazardous materials used in the production of apparel and ensuring clean water so that chemicals don't leak into the drinking water		Gap, Inc. store designers are seeking LEED accreditation for new stores and are assessing existing stores
Planet	Organic cottons have less of a negative impact on the environment		Gap, Inc. is ensuring clean water practices in denim laundries		Gap, Inc. store designers are seeking LEED accreditation for new stores and are assessing existing stores
Profit		Because of the increasing demand for organic and naturally grown cotton, farmers are increasing profits			Companies like Gap, Inc. are charging more for organic products and making a larger profit margin
Governance		Gap, Inc. was a founding member of the Better Cotton Initiative (BCI) to promote sustainable cultivation practices	Gap, Inc. has sent Social Responsibility Specialists to underdeveloped countries like Lesotho to examine the factories and detect any potential problems		



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## AUTHORS PROFILES

Sarah McGovern is a student in the Part-time MBA Program at the University of Connecticut, Stamford Campus and is the Director of Education & Member Services for the Connecticut Association for Home Care & Hospice. This case study was the final project in fulfillment of the requirements for Prof. Dowding's "Principles of Global Sustainability" course. Please direct any correspondence to her at: [sarahmc99@gmail.com](mailto:sarahmc99@gmail.com)

Timothy J. Dowding, Ph.D. is a Professor-in-Residence, Operations & Information Management Dept. and the Director of *edgelab* at the University of Connecticut, Stamford Campus. Please direct any correspondence to him at: [Timothy.dowding@business.uconn.edu](mailto:Timothy.dowding@business.uconn.edu)