“What are the methods of sustainable cotton production and how does it impact those in the production process? How is the manufacturing process in Karachi effected?”

By

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Indus Valley School of Art and Architecture
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“What are the methods of sustainable cotton production and how does it impact those in the production process? How is the manufacturing process in Karachi effected?”

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This Thesis submitted in partial fulfilment of the requirements for the degree of BACHELOR OF TEXTILE DESIGN, from Indus Valley School of Art and Architecture.

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ABSTRACT
This dissertation examines the role of sustainable cotton production and manufacturing in Karachi today. The methods of sustainability used in the production process of the cotton crop and in the manufacturing process in the mill. It gives an in-depth analysis of the impacts of sustainable production and manufacturing and how it has impacted the labour force, environment and natural resources in general. My primary research focuses on manufacturing processes in mills in Karachi, the cost effectiveness of sustainable manufacturing as well as its effects on those involved in it. While my secondary research compiles different methods and impacts of sustainable production practised around the world today.
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INTRODUCTION
‘If you describe something as ethical, you mean that it is morally right or morally acceptable.’

Over the past few years I have realized that it is my moral responsibility to take care of the environment that surrounds me, not just confining myself to my personal space but other spaces that I may visit. That didn’t necessarily restrict me to a greener environment but even keeping an area clean.

I personally feel that every person is and should be responsible for their surroundings and often it takes a combined effort to take an initiative such as this. It is with this thought that I decided to conduct my dissertation on textile mills in Karachi and what sustainable production is taking place and its impacts on producers and those connected to it in general.

Initially my topic started from ‘ethical fashion.’ The website for Victoria and Albert Museum describes ethical fashion as a term used to describe ‘ethical fashion design, retail, and purchasing. It covers a range of issues such as working conditions, exploitation, fair trade, sustainable production, the environment, and animal welfare.’

I then narrowed it down to one of the issues that ethical fashion covers- sustainable production. After conducting some research I decided to focus on sustainability of cotton production.

The agricultural sector of Pakistan has been one of the largest providers to the economy and it still continues to be so, and cotton being one of the staple crops of Pakistan, has a

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2 ‘What is ethical fashion?’ Victoria and Albert Museum website. http://www.vam.ac.uk/content/articles/w/what-is-ethical-fashion/ [Last accessed: 2nd December 2012]
lot of importance in the economy. David Orden states in his article, ‘Pakistan's cotton and textile economy’ that ‘Pakistan’s economy relies heavily on its cotton and textile sectors. The cotton-processing and textile industries make up almost half of the country’s manufacturing base, while cotton is Pakistan’s principal industrial crop, supplying critical income to rural households.’ It is also used in the manufacturing and production process of different kinds of cloth, that is- lawn, cotton, polyester, jersey, linen, voil, denim. This cloth is used in different products such as apparel, bed sheets, home textiles and other products that may be sold locally or exported outside Pakistan too.

Before the reader begins to read further into my dissertation I would like to clarify the meaning of sustainable production, ‘[Sustainable production and consumption is] the use of goods and services that respond to basic needs and bring a better quality of life.’ I feel that in order to achieve a better quality of life we must efficiently use our resources, which will lead to a better economy, an eco friendly environment, higher standard of living and eventually a better future. Edwin G Falkman states that ‘Sustainable production and consumption involves business, government, communities and households contributing to environmental quality through the efficient production and use of natural resources, the minimization of wastes, and the optimization of products and services.’

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Hence, keeping in mind the importance of cotton in our economy I decided to conduct my dissertation on the methods of sustainable production that are being used while producing cotton crop and how it may be affecting those in the production or manufacturing process in Karachi.

My dissertation targets textile mills in Karachi that are using cotton in their production process. The secondary research will delve into sustainable production practices that may be taking place, what they are and how they are affecting the producers and manufacturers of the mills. It will also briefly discuss the impact of sustainable production on not just the producers and manufacturers but those connected to it, such as the environment, labourers, and farmers and how the resources and economy may be affected by sustainable production. Following this will be a detailed analysis of research methods consisting of my primary research that may have been used in order to collect first hand findings about the topic being discussed. Furthermore I will apply these methods in the Findings and Analysis chapter and give an in depth analysis of my findings as well as briefly compare and discuss sustainable production that may be happening internationally.
LITERATURE REVIEW

In today’s world everything is globalised and globalisation means that resources can be used from all over the world for products that have a demand in most countries and are supplied there. In order to maximize profits many firms and multi national companies use industrialised and mechanised methods of growing cotton, which means that fabrics can be produced quickly and cheaply and in very large quantities.

Pakistan is the fifth largest producer of cotton in the world, the third largest exporter of raw cotton, the fourth largest consumer of cotton, and the largest exporter of cotton yarn.6 This means that Pakistan has a large role to play in the production of cotton to maintain its sustainability in order to prevent further destruction to the environment.

Methods and impacts of sustainable cotton production:

There are various methods of sustainable cotton production and it starts from the very growth of cotton itself. So basically an entire cycle follows starting from the growth of cotton (the raw material), the manufacturing process, distribution of the material, retailer and then finally the product reaches the consumer. 7

Cotton as a Raw Material:

The Better Cotton Initiative (BCI) Pakistan is an organisation that works with the World Wide Fund (WWF) as an implementing partner since 2010 in order to make farming

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6 Author unknown, ‘Role of Cotton in Pakistan’
http://www.pakissan.com/english/allabout/crop/cotton/the.role.of.cotton.in.pakistan.shtml
[Last accessed: 12th January 2013]

7 Author unknown, ‘Building a Sustainable Supply Chain’, The Times 100 newspaper
[Last accessed: 14th January 2013]
methods more sustainable in Karachi and Punjab. It aims to:

1- Reduce the environmental impact of cotton production

2- Improve livelihoods and economic development in cotton producing areas

3- Improve commitment to and flow of Better Cotton throughout supply chain

4- Ensure the credibility and sustainability of the Better Cotton Initiative

So far the BCI website states that the average yield of cotton has improved and is now producing 8% higher than that of other farmers. The usage of water has also decreased by 20% as well as the use of pesticides that has decreased by 38%. So if we go back and recall the introduction where Falkman states that sustainable production includes ‘environmental quality through the efficient production and use of natural resources’; we can see that the same is being done by the BCI.

Let me further explain how so, as the BCI website states they train the farmers to reduce sustainable cotton. As we can see here efficient production is taking place since the yield of cotton per hectare has increased and at the same time, water, a natural resource, is also being conserved since it is being used less and the environmental damage is much lesser since there is a 38% decrease in the use of pesticides.

However, along with this Better Cotton farmers also earn higher profits, ‘profitability was 35% higher than that of the control farmers.’ The possible reasons mentioned for this on

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the BCI website is that it may be due to the fact that their farmers save up on money which may be spent on commercial fertilisers, pesticides and water and at the same time they are producing a higher yield which results in higher profit.\(^\text{12}\)

On the other hand, in a book called ‘*Well dressed? The present and future sustainability of textiles in the United Kingdom*’ \(^\text{13}\) an analysis is given by the authors to suggest what possible methods may help improve the environmental, economic and social changes in the production process as well as consumer behaviour.

The authors state that environmental performance can be improved if the material used is mainly taken care of, keeping in mind its toxic levels. However, they have different ways of sustainability for the raw material and production process. In the products where the produce of cotton as a raw material dominates they suggest that different processes or materials should be used such as a change from normal cotton to organic cotton which would result in lesser toxic waste in the environment. However, here we see that this may increase prices of goods in the UK. In an article ‘*Organic Cotton: Biggest markets are Europe and the United States*’ Dr. Noor Ahmed Memon defines that ‘Organic production is based on a system of farming that maintains and replenishes soil fertility without the use of toxic and persistent pesticides and fertilizers or genetically-modified seeds.’\(^\text{14}\)

\(^\text{12}\) Author unknown, ‘Pakistan’, Better Cotton Initiative Website
http://bettercotton.org/in-the-field/region-status/pakistan/
[Last accessed 15\(^\text{th}\) January 2013]

\(^\text{13}\) Julian M Allwood, Cecilia Malvido de Rodriguez, Nancy M P Bocken, ‘*Well dressed? The present and future sustainability of clothing and textiles in the United Kingdom.*’ Published by University of Cambridge Institute for Manufacturing (2006), p.3
[Last accessed: 22\(^\text{nd}\) January 2013]

\(^\text{14}\) Dr. Noor Ahmed Memon, ‘Organic Cotton: Biggest markets are Europe and the United States’
[Last accessed: 30\(^\text{th}\) January 2013]
In the book ‘Well dressed’ the authors state that the raw material may bring about an incredible decrease in environmental issues, reducing toxic as well as water usage (as mentioned above). So we can see that the initial production process plays a major role and the BCI may have reduced a lot of environmental damage through their training programmes.

According to a synthesis report, ‘Sustainable Manufacturing and Eco-Innovation: Framework practices and movement’ written by the ‘Organisation For Economic Co-Operation and Development (OECD)’ there is a closed loop production system that exists. This system starts from natural resources from which there is minimal natural resources extraction which is the raw material which is used in the manufacturing process. This is then used in production and goes on to packaging and distribution, the product is then used and maintained and recycled along with waste left over from the production process, thus the cycle repeats where the recycled products along with the raw material is once again used in the manufacturing process and so on.

So if the raw material used is environment friendly then there is lesser damage to the environment, lesser toxic is produced, lesser water used and the farmers are earning more (as mentioned by the BCI). So basically sustainable production leads to content farmers earning more which means that their families are also living a better life, less hazards to life since pesticides are used in a considerably less amount as well as a healthier

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http://www.ifm.eng.cam.ac.uk/uploads/Resources/Other_Reports/UK_textiles.pdf [Last accessed: 22\textsuperscript{nd} January 2013]

environment.

As the authors of the book *Well dressed?*\(^{17}\) suggested that organic cotton is a method for sustainable production, Leben Braucht Wasser, author of the book *From the Plant to the T-Shirt*\(^{18}\) informs the reader that organic cotton is grown without the use of fertilisers as well as ‘genetically modified seeds’. Instead it is fertilized with manure which also helps increase the soil’s fertility.

Wasser also mentions, as the BCI had, that farmers are at a reduced financial risk since they no longer need to use pesticides and fertilisers. Instead of using pesticides they ‘spray plants with herbal extracts.’

In an article called *Market: The Availability of Organic Cotton*\(^{19}\) the author informs us that most of the organic cotton produced is consumed by companies with large organic textile programmes such as C&A, Nike, Walmart/Sam's Club, Williams-Sonoma, Inc., H&M, Anvil Knitwear, Coop Switzerland, Greensource, Levi Strauss.’ So we can see that as mentioned in the article *Building a Sustainable Supply Chain* published by *The Times 100*\(^{20}\) newspaper, sustainable production not only includes the production and manufacturing process but the retailers have a role to play too in order to encourage such practices.

**Cotton in the Mills:**

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[Last accessed: 22\(^{nd}\) January 2013]

[Last accessed: 10\(^{th}\) February 2013]

[Last accessed: 10\(^{th}\) February 2013]

[Last accessed: 14\(^{th}\) January 2013]
After having understood in depth the procedure used for sustainable cotton growth in the farming sector we realize that there is an overall benefit. We now know that farmers are spending less and yet they are making higher profit, which means that in the long run the cost for cotton as a raw material would decrease for those buying cotton for their mills, whereas, those who own farms as well as mills would have an even bigger advantage. So the next step would be the cotton that is being supplied to the mills and the sustainable efforts being made in the manufacturing process.

In a book called ‘Sustainability for Manufacturers: Driving profitability and Growth’, 21Gina Blus states that the process of manufacturing is resource intensive. Blus says that ‘Common sense dictates that using less energy and water during production and reducing materials waste will help a business lower its costs and operational footprint.’ 22However, some producers may not succumb to sustainable production since they may feel that using fewer resources may produce a product with higher quality. However, the effect is proven later on when the overall mill may incur higher profits in the long run through sustainable methods.

In the book ‘Well Dressed?’ 23the authors tell us that energy requirements in the cotton industry are dominated by procedures of washing, drying and ironing. In order to provide a sustainable solution washing temperatures may be reduced and tumble drying avoided

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[Last accessed: 20th February 2013]
altogether. Along with that technological innovations may be used to extract fibre from recycled textile goods. Whereas the weaving sector is concerned, cloth may be recycled and the shards used for reproduction of cloth.\textsuperscript{24}

In an article ‘Towards more Sustainable Cotton’\textsuperscript{25} on the H&M website the term ‘recycled cotton’ is mentioned. This refers to the process of cotton which is recycled from the remnants of textile production. ‘These are ground into fibre, spun into new yarns and woven into new fabrics.’ The benefits for this are the reduced use of cotton as a raw material, which leads to lesser use of chemicals and resources such as water and land.

So as we can see that the role of cotton as a raw material is important since that is the initial stage of the process and it has a great impact on natural resources since a reduced use of water greatly benefits the environment as well as lesser use of pesticides which means that the soil is better for future harvest of cotton, it is beneficial in the long term. Not only are the natural resources impacted but farmers’ standard of living also improves since they earn more by making more profit.\textsuperscript{26}

At the same time we can see that the manufacturing process has a huge role to play. We can see how the entire process of cotton works, its history, where it is coming from, what problems it faces and realise that it is extremely important to understand the problems it faces before seeing its impacts in the textile industry itself. The role of manufacturers is


\textsuperscript{26} Author unknown, ‘Pakistan’, Better Cotton Initiative Website http://bettercotton.org/in-the-field/region-status/pakistan/ [Last accessed 21\textsuperscript{st} February 2013]
extremely important since they are the ones buying the cotton, and it is their responsibility to make sure the cotton they are buying is sustainably produced or encourage the sustainable growth of cotton and perhaps even provide training programmes. Hence, cotton crop in its original form directly impacts the manufacturers and producers.

These manufacturers produce products for many retail outlets as well as their own firms if they own a brand. As we read earlier many of these are high street fashion brands such as H&M, Levi Strauss, etc, which means that many mills are exporting products and are providing globally to retailers. 27 Knowing this adds more importance to the manufacturing process and it is extremely important to use sustainable technologies and the recycling process 28 as mentioned earlier, which means that perhaps there is a high cost of buying this technology, but it reduces damages to the environment greatly and it may be cost effective in the long-term as well.

**Social Impacts of Sustainable Cotton Production:**

Bayer CropScience’s book ‘*Sustainable Cotton Production*’ states that ‘The social pillar of sustainability in the cotton value-chain encompasses aspects such as employment and livelihood improvement as well as health, hygiene, labour conditions, education and the overall quality of life.’ 29

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27 Author unknown, ‘Building a Sustainable Supply Chain’, The Times 100 newspaper
[Last accessed: 28th February 2013]

28 Author unknown, ‘Towards more sustainable Cotton’ H&M website
[Last accessed: 28th February 2013]

29 Bayer CropScience, ‘*Sustainable Cotton Production*’, p 22
In an article called ‘*Cotton and the Environment*’ published by the Organic Trade Organisation it is said that rural farmers lack basic safety equipment, protective clothing, and are not properly trained for handling chemicals such as pesticides. In India, about one tenth of pesticides applied to farms result in farmers falling sick due to improper usage of pesticides. Some surveys have shown that in some areas farmers even store pesticides in their bedrooms or close to food items or reutilize containers in which pesticides are given for drinking water. This results in high risk for ‘acute pesticide poisoning’ for farmers and their families.30

The ‘Soil Association’ 31 states that sustainable cotton production is better for workers in developing countries. The reasons being that by avoiding pesticides, health problems may be avoided altogether and it also reduces cost for the farmers. The reduced usage of genetically modified cotton also reduces health hazards.

The reduced cost for farmers means that there is an increase in the standard of living, better living and health conditions, better education for their family, which means that better farming may take place and they may face a better future. However, some farmers may want to move to the urban areas and look for other jobs after getting education and may not necessarily continue doing what their fathers did.

On the other hand, in the production process harmful manufacturing chemicals aren’t
used and a waste water plant and sound environmental policy are carried out. Fewer toxic chemicals are used which have been ‘associated with cancer, birth defects and hormonal and reproductive effects in wildlife and humans.’

Factory conditions are better with the use of controlled toxic chemicals and sound pollution. However, other issues such as ‘working conditions, minimum wages, child labour, freedom of association, discrimination’ are also taken into account. This means that the workers have a voice and improvement of working conditions means that workers may be more motivated and productivity levels may increase as well as unity in the firm.

Final products produced by the mills are also toxic free, which may not be the case in places where sustainable manufacturing methods may not be used. ‘These residues can be inhaled or absorbed through the skin and may cause allergies, skin rashes or respiratory problems. Babies are particularly vulnerable as their skin is much thinner than adults.’

**Environmental Impacts of Sustainable Production:**

Bayer CropScience’s book ‘*Sustainable Cotton Production*’ talks about how cotton production and consumption must be environment friendly as well. ‘Cotton production must use cotton more efficiently and maintain the functional integrity of soil and eco-

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Soil fertility is a main priority for farmers and the use of natural fertilization methods and less use of pesticides help improve soil fertility. A balanced agricultural system also reduces pest attacks and diseases so the crop and the soil both improve. There is an increase in biodiversity since fewer bugs are killed and there is a variety in crop production.

Climate change is also prevented since fertilisers are not used which minimizes the emission of green house gas. This may have a huge environmental impact in the long run so avoiding it is extremely important.

Less usage of water also means that we are saving a natural resource that is rapidly decreasing and effluent plants help save marine life from being affected by the waste and toxic material emitted from waste water in the mills.

Hence, there is a major decrease in land pollution, water pollution and climate change which further enhances the importance of sustainable production of cotton.

35 Bayer CropScience, ‘Sustainable Cotton Production’, p 22
36 Simon Ferringo, Alfonso Lizgarra, ‘Components of a Sustainable Cotton Production System’, (March 2009) p 19
37 Author unknown, ‘benefits of Organic’
RESEARCH METHODOLOGY:

The research for this dissertation, ‘What are the methods of sustainable cotton production and how does it impact those in the production process? How is the manufacturing process in Karachi effected?’ was divided into primary and secondary objectives.

Primary objective: The methods of sustainable cotton in the field and impact of sustainable manufacturing in the mill.

Secondary objectives:
1) Methods of sustainable production of cotton as a raw material and cotton in the mills.
2) Social impacts of sustainable production.
3) Environmental impacts of sustainable production.

For my primary research I collected qualitative data by conducting interviews, some of these were conducted online, some in person and some on the phone. The interviews were mostly conducted with mill owners in order to find out what methods of sustainable production were being used and how the manufacturing process is sustainable, in what ways. Initially I had a structured questionnaire but during my interviews the answers I was receiving made the interview go in a direction I hadn’t planned, hence, where the information was reliable I asked further questions and where it was not I proceeded back to my original questions.

The questions ranged from where the mills were buying cotton from, the methods of sustainable production used in the mill, if sustainability is affecting them in anyway and its cost effectiveness as well as the effects on labour and natural resources.
This lead me to finding out about the entire process of sustainable production and I got a lot of details about the impacts on the firms.

However, it was extremely difficult to approach owners or mills in general and I only managed to conduct my interviews through sources, as a result of which I managed to get a total of five interviews, I felt this limited my primary research though the information I received was extremely helpful along with the fact that these are extremely large scale firms so their information was reliable. I also feel that there was no bias in my interviews nor were they influenced by anything, though perhaps the fact that these firms were all large scale is biased in a way that I did not approach small firms except for one by the name of ‘Nadeem Industries’.

In my analysis I plan on doing a content analysis, that is, discussing my primary research and comparing it with data in my secondary research.

In my secondary research I started with researching the methods of sustainable cotton production in the mills as well as cotton as a raw material since I feel that it is important to understand the beginning of a process and where it originates from before analysing its consequences. After having researched this it will also be easier for me to analyse my findings since I can compare both primary and secondary research.

After having researched the methods I went on to discuss the impact of sustainable cotton production and manufacturing on the environment and socially as well.

This covered areas of child labour, health hazards that may be caused due to lack of sustainability, improved standard of living, higher profits as well environmental impact on soil, climate, water, land and natural resources in general as well as its effect on the eco system.
Hence, the secondary research clearly explains methods and impacts of sustainable cotton growth and manufacturing to the reader, giving them a strong base in order to understand the primary research that has been conducted as well as the analysis.
FINDINGS AND ANALYSIS:

In his article, ‘Pakistan’s cotton and textile economy’, David Orden states that ‘Pakistan’s economy relies heavily on its cotton and textile sectors. The cotton-processing and textile industries make up almost half of the country’s manufacturing base, while cotton is Pakistan’s principal industrial crop, supplying critical income to rural households.’

In an interview I conducted with Mr. Nadeem Abdullah, the owner of ‘Sapphire Textile Mills’ I found out that ‘majority of the cotton consumption is from Pakistani cotton’ in their mills, however, he mentioned that this poses a risk since sometimes the cotton crop is contaminated. Due to this cotton is imported too from some areas such as ‘U.S, Brazil, Greece’, since these countries spin finer counts.

In his interview Kamran Shoaib, manager development at ‘Alkaram Textile Mills’ also said that the cotton produced in Pakistan was of a ‘coarse count’. He further went on to explain that cotton with a count of forty and above was imported since it is not produced in Pakistan, and that counts of 60 and 80 are used to produce lawn since it is the finest count of cotton.

This shows that perhaps a large quantity of cotton is being imported from other countries since lawn is a material that is worn by many women in Pakistan since it is the finest cloth available and many women prefer wearing it in the hot climate during summer especially.

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39 Nadeem Abdullah, Sapphire Textile Mills, interviewed 29th April 2013. [Interview conducted on the phone, notes were taken]

40 Nadeem Abdullah, Sapphire Textile Mills, interviewed 29th April 2013. [Interview conducted on the phone, notes were taken]

41 Kamran Shoaib, Alkaram Textile Mills, interviewed 27th April 2013. [Interview was recorded and transcribed]
Sustainable Cotton Production in the Field:

Kamran Shoaib also informed me that ‘Bukhari’ farms is one of the few farms that is now producing cotton with a fine count. When I asked further as to why this was the case Shoaib told me about the ‘Better Cotton Initiative (BCI)’. As mentioned in my literature review the Better Cotton Initiative (BCI) Pakistan is an organisation that works with the World Wide Fund (WWF) as an implementing partner since 2010 in order to make farming methods more sustainable in Karachi and Punjab. 42

Kamran Shoaib went ahead and told me the advantages of BCI and what they are currently doing in Pakistan. He informed me that the BCI was initiated by the United Nations which started this programme in order to reduce poverty, hence, BCI was initiated. ‘BCI production techniques are currently practiced in India, Pakistan and China and recently in Bangladesh as well.’ 43 The BCI website stated that in Pakistan they are practicing in Karachi and Punjab, and Shoaib informed me that it is mainly practiced in Upper Sindh and in Punjab due to the fact that there is more water available in these areas. 44 Whereas, Nadeem Abdullah, owner of ‘Sapphire Textile Mills’, said that there are ‘approximately 800,000 cotton farms in lower Sindh and Punjab’ 45, while Shoaib said that they are mostly in Upper Sindh. Abdullah said that Sapphire owns various factories in Sindh (he did not specify how many when asked) out of which two are in Nooriabad, and some are in Tandolayar, Sindh and Khanewaal in Punjab.

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43 Kamran Shoaib, Alkaram Textile Mills, interviewed 27th April 2013. [Interview was recorded and transcribed]
44 Kamran Shoaib, Alkaram Textile Mills, interviewed 27th April 2013. [Interview was recorded and transcribed]
45 Nadeem Abdullah, Sapphire Textile Mills, interviewed 29th April 2013. [Interview conducted on the phone, notes were taken]
Kamran Shoaib told me about what BCI is doing to promote sustainable cotton production. They are providing training facilities for the farmers in which they tell the farmers to avoid using chemical fertilisers in order to improve the soil’s quality and control the soil. The BCI also keeps in mind the cost of production of the cotton, avoids usage of unnecessary pesticide, which results in a healthier crop, reduces costs for the farmers and the environment is unaffected.  

On the other hand, Nadeem Abdullah mentioned that BCI mainly focuses on production methods by training farmers. It also makes sure that there is no child labour, fair wages for workers, less water is consumed and less pesticide used. In order to collaborate with BCI and receive their cotton they need to be certified under the ‘Social Compliance FA 8000,’ which means that sustainable processing is important in mills such as water treatment plants. Wajeed Ali, owner of ‘Kasim Textiles’ also mentions that BCI has been operating in Pakistan since the past three years and aims to help farmers.

As mentioned in my literature review the BCI website states that the average yield of cotton has increased and is 8% higher than what was being produced earlier. Water consumption has also decreased by 20% and the use of pesticides by 38%. Not only this but the farmers are now earning 35% more profit in comparison to ‘conventional’ farmers.

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46 Kamran Shoaib, Alkaram Textile Mills, interviewed 27th April 2013. [Interview was recorded and transcribed]
47 Nadeem Abdullah, Sapphire Textile Mills, interviewed 29th April 2013. [Interview conducted on the phone, notes were taken]
48 Wajeed Ali, ‘Kasim Textiles’ interviewed 1st May 2013. [Interview conducted on phone, notes were taken]
49 ‘Conventional farming’- methods of farming in which chemicals are used or genetically modified seeds, pesticides, fertilizers, etc.
So as we can see there is an environmental and a social change. The soil quality improves due to less use of pesticides, fertilizers and genetically modified seeds. Since the farmers are trained there are fewer pest attacks and diseases that may spread amongst the crop. Not only that but health hazards are also reduced since fewer chemicals are being used or being stored within the farmers surrounding areas. Water is also conserved and production costs reduce which means farmers may make higher profits now.

As mentioned in my literature review there is an increase in biodiversity since fewer bugs are killed and there is a variety of crop production. Land as a natural resource is also utilised to its fullest since the yield has increased in the past few years.

Since the farmers are earning more now there standard of living has increased, Kamran Shoaib said in his interview that many farmers now have motorbikes and can travel easily which also means that their work may expand.

An increase in standard of living also means that children can now receive education, however, I feel that the concept of reducing child labour may be opinionated. The reason being that many children may not be doing intensive work but providing a helping hand for their fathers at work in the fields. This can be done after school hours as well and would add to the child’s skills for learning about farming methods. I feel that instead of referring to it as child labour, perhaps certain standards should be set as to what activities should be allowed for children to do and what should not be allowed since it may

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51 Simon Ferringo, Alfonso Lizgarra, ‘Components of a Sustainable Cotton Production System’, (March 2009) p 19  
[Last accessed: 29th March 2013]

52 Simon Ferringo, Alfonso Lizgarra, ‘Components of a Sustainable Cotton Production System’, (March 2009) p 19  
[Last accessed: 29th March 2013]

53 Kamran Shoaib, Alkaram Textile Mills, interviewed 27th April 2013. [Interview was recorded and transcribed]
physically over burden them, etc. This is something I never thought about till it was discussed in my second year at university in a lecture about carpet weavers, where Mrs. Shehnaz Ismail, head of the textile design department, shared her opinion with us and I agreed to it.

In his interview Kamran Shoaib mentioned that in order to produce good cotton the characteristics of the seeds are extremely important. At a certain time period some years ago Pakistan was producing cotton with a high count, it was called BT cotton and its quality was high, many people were studying from the ‘Cotton School of Multan’, however, with time the staple length reduced from 1.14 to 1.09 and the quality of cotton fell rapidly.\textsuperscript{54}

The reasons for this were that there was no controlled system; farms were given to uneducated farmers who used bad seeds. This lead to less yield of cotton since there were fewer balls of cotton produced per plant with less weight. The price of the seeds and production process was the same but fewer amounts were produced per acre.\textsuperscript{55} Hence, farmers had no incentive, were demotivated, land went to waste and impacted the overall production of cotton.

When asked if Alkaram owns any farms that produce cotton, Kamran Shoaib replied that Alkaram does not own any but they do cotton field surveys to see and judge the quality of cotton. He said that ‘corporate lawn is less’ but with time ‘farming has shifted to real estate’ as a result of urbanisation causing changes to occur.\textsuperscript{56}

\textsuperscript{54} Kamran Shoaib, Alkaram Textile Mills, interviewed 27\textsuperscript{th} April 2013. [Interview was recorded and transcribed]
\textsuperscript{55} Kamran Shoaib, Alkaram Textile Mills, interviewed 27\textsuperscript{th} April 2013. [Interview was recorded and transcribed]
\textsuperscript{56} Kamran Shoaib, Alkaram Textile Mills, interviewed 27\textsuperscript{th} April 2013. [Interview was recorded and transcribed]
I feel that this may be so because as businesses are expanding and travelling becoming easier, lands more accessible, and with technology available for communicating at vast distances it is becoming easier for the rural and urban areas to interact with each other. Also, some large scale businesses may want to intervene with farmers in order to produce a certain quality crop, and to own their own farm would mean that the cotton production is in their hands since the beginning process to the end product will be owned by them reducing any chances of problems and doing what is personally suitable for them. Since it would be a part of their firm they won’t have to pay extra profit but just buy the land and pay the workers who are working there.

**Sustainable Cotton Manufacturing in the Mills:**

In a book called ‘*Sustainability for Manufacturers: Driving profitability and Growth*’, Gina Blus states that the process of manufacturing is resource intensive. Blus says that ‘Common sense dictates that using less energy and water during production and reducing material waste will help a business lower its costs and operational footprint.’

Nadeem Abdullah, owner of Sapphire textiles, informed me about various sustainable methods being used in their mill. He felt that sustainable production had very positive effects. Recently they have introduced a new processing unit which consists of environmental friendly equipment. Initially cold boilers were being use in the mills but now they are using biomass boilers, the price for which is approximately four times

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57 Gina Blus, *Sustainability for Manufacturers: Driving profitability and Growth*, Published by Autodesk (2008) p.6
[Last accessed: 20th February 2013]

[Last accessed: 20th February 2013]
higher than that of cold boilers. Cold boilers are sold locally and are not environment friendly.\(^59\)

Along with this a water treatment and discharge plant is also being used, where water is disposed off carefully and reused. Besides this filtration systems are also used in factories through which dust is sucked in which collects in the central room, hence, it does not affect the workers environment. All departments in the mill have air changes and workers are provided with earplugs to avoid the effects of noise pollution.\(^60\)

As a result workers are happy and produce better work. As for the new machinery, even though it is expensive it needs lesser space and lesser labour is required and it produces upto 100kg/hr whereas the old machinery would produce 10 kg/hr.\(^61\)

So we can see that even though the cost of machinery is high the output is equally higher and reduces costs as well as impacts the environment since there are lesser toxic material and carbon emissions\(^62\) as well as a more satisfied labour force.

On the other hand, Kamran Shoaib of Alkaram Textile Mills told us that as a result of sustainable manufacturing profits for the firm are reduced. However, they still continue to spend money since it is ‘commitment for the masses’ and in order to prevent hazardous chemicals which may come from discharge printing such as pigments and dyes that are being used an ‘efuelent treatment plant’ is set up. This cleans the discharged water for reuse, as told by Nadeem Abdullah as well. Kamran Shoaib explained how this would

\(^{59}\) Nadeem Abdullah, Sapphire Textile Mills, interviewed 29\(^{th}\) April 2013. [Interview conducted on the phone, notes were taken]

\(^{60}\) Nadeem Abdullah, Sapphire Textile Mills, interviewed 29\(^{th}\) April 2013. [Interview conducted on the phone, notes were taken]

\(^{61}\) Nadeem Abdullah, Sapphire Textile Mills, interviewed 29\(^{th}\) April 2013. [Interview conducted on the phone, notes were taken]


[Last accessed: 13\(^{th}\) February 2013]
impact the sea since water is disposed there, it will lead to a reduction in oxygen levels, which will directly impact marine life. If the same water is used for irrigational purposes it will affect the soil and if someone uses it as drinking water it may cause skin cancer.

Shoaib stated that approximately six lakhs or above are spent monthly on the effluent plant and it is just for the environment but Alkaram chooses to provide sustainability and spend that money.

However, this completely contradicts Gina Blus’s statement that ‘using less energy and water during production and reducing material waste will help a business lower its costs and operational footprint.’ It is also in contrast to what Nadeem Abdullah stated that sustainable machinery produces ten times more and requires lesser labour and land.

In an interview with Bilal Nadeem, owner of ‘Nadeem Industries’, Nadeem explained how sustainable production impacts their production since they can’t run their machines ‘on their maximum capacity/RPM as more dust and oil smoke is produced by doing so. Lets say if we can produce 150 meters of cloth on one loom in 12 hours, we’re producing 140 meters instead as less affective to the environment.’

So there is a major contradiction as to whether sustainable production is cost effective for the mills or not and whether it benefits the firm or not. In some cases such as Nadeem industries the impact is on production whereas in the case of Alkaram the impact is on reduction of profit due to the money spent on the water treatment plant.

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63 Gina Blus, *Sustainability for Manufacturers: Driving profitability and Growth*, Published by Autodesk (2008) p.6  
[Last accessed: 20th February 2013]

64 Nadeem Abdullah, Sapphire Textile Mills, interviewed 29th April 2013. [Interview conducted on the phone, notes were taken]

65 Bilal Nadeem, ‘Nadeem Industries’ interviewed on 15th March 2013. [Online interview taken]
However, perhaps the most interesting twist in my primary research was my interview with Wajeed Ali, owner of ‘Kasim’ Textiles. In previous interviews where I asked about the cost required for sustainable technologies and machines the people being interviewed seemed slightly hesitant, followed by a pause in the interview I realized that perhaps it was unethical to ask such a question since it may be the firms private information. However, in my interview with Wajeed Ali, which was by coincidence my last interview, Ali informed me that there were no negative effects of sustainable cotton production. The reason being that the water plant and other sustainable machines being used by Kasim Textiles are sponsored by retail brands which are often multinationals such as Levis, H&M, ZARA, Aeropostle and Marks & Spencer. These are the brands which sponsor the payments of these plants and encourage sustainable production leaving the mill with no need to pay any cost for sustainability. 66

I asked if this was something done in most mills and Ali replied that yes, most mills are sponsored by retail outlets. As I also mentioned in my secondary research in an article called ‘Market: The Availability of Organic Cotton’67 the author informs us that most of the organic cotton produced is consumed by companies with large organic textile programmes such as C&A, Nike, Walmart/Sam's Club, Williams-Sonoma, Inc., H&M, Anvil Knitwear, Coop Switzerland, Greensource, Levi Strauss.’ So we can see that as mentioned in the article ‘Building a Sustainable Supply Chain’ published by ‘The Times 100’ 68 newspaper, sustainable production not only includes the production and

66 Wajeed ali, ‘Kasim Textiles’ interviewed 1st May 2013. [Interview conducted on phone, notes were taken]
manufacturing process but the retailers have a role to play too in order to encourage such practices.

So it seems that retail outlets perhaps have the largest role to play in this case since they are the ones encouraging the production as well as the manufacturing process. Where I cannot be sure as to other firms being sponsored by multinational retailers the concept does make sense. These high street fashion brands are established globally except for a few countries and they have shops in various malls in just one city, hence, they earn a large amount of profit, especially since production and manufacturing is being done in developing countries such as Pakistan where labour costs are extremely cheap. Another advantage they have is that the currency rate is also lower which means that they can make extremely high profits; hence, they do have enough cash flow to encourage environmental sustainability.

Health is also taken care of in the manufacturing process in order to provide workers with better working conditions. In an interview with Rizwan Zafar, Alkaram Textile Mill, he told me that workers are provided an air-conditioned environment and water is provided continuously as well as a break after every 50 minutes. Sound pollution is also controlled at a level of 96 decibels as is recommended by the ISO. Workers are provided with earplugs.69

He also told me that dust collected from fibre in the spinning area is filtered by air ducts, collected, and recycled to make yarn again. If it is coarse cotton it is used to make rugs.

As mentioned in my literature review in an article ‘Towards more Sustainable Cotton’70

[Last accessed: 14th January 2013]

69 Rizwan Zafar, Alkaram, interviewed on 27th April 2013
70 Author unknown, ‘Towards more sustainable Cotton’ H&M website
on the H&M website the term ‘recycled cotton’ is mentioned. This refers to the process of cotton which is recycled from the remnants of textile production. ‘These are ground into fibre, spun into new yarns and woven into new fabrics.’ The benefits for this are the reduced use of cotton as a raw material, which leads to lesser use of chemicals and resources such as water and land.

Bilal Nadeem of Nadeem industries stated that their machines go through a routine maintenance every week so that it creates as little trouble as possible for the weavers and the atmosphere within the unit.

Overall, it can be said that sustainable cotton production is taking place to a large extent in Karachi and social, environmental concerns are being taken care of in the production as well as the manufacturing process. However, I feel it will take a few years for firms to initiate their own sustainable production and for farmers to practice it on their own, for this a lot of training and awareness is required, but the process has started nonetheless.

[Last accessed: 23rd February 2013]

71 Bilal Nadeem, ‘Nadeem Industries’ interviewed on 15th March 2013. [Online interview taken]
CONCLUSION:

After having researched in depth through methods of primary and secondary research the various methods of sustainable production and their impact on the production and manufacturing process of cotton we can see that the entire industry is interlinked. Starting from the growth of cotton we see how it impacts the farmers, the soil, the environment, the production of cotton itself. In the manufacturing process we see how the labourers, the environment and land is affected by sustainable production. In both cases natural resources are affected, that is, land and water as well as labour.

We see that sustainable production reduces costs in the production process where cotton is being grown and is extremely beneficial. Whereas, in the manufacturing process we can see that there are mixed opinions about the cost and whether sustainable technology is beneficial for the overall firm or not.

However, the most interesting finding in my primary research was that perhaps firm owners would like people to assume that they are the ones sponsoring sustainable practices that are taking place, while in reality perhaps it is the multinational retail outlets that are doing so.

Since multinational retail outlets are spread globally and earn large amounts of profit, and considering that their production often takes place in developing countries where land and labour costs are comparatively much cheaper as well as low currency rates, it is possible for them to have large amounts of cash flow. Hence, they can afford to sponsor sustainable development programmes. Likewise, the United Nations has sponsored the Better Cotton Initiative (BCI) for the production process; same may be the case for retailers in the manufacturing process.
So we see that retailers have a major role to play as do organisations such as BCI that are providing training programmes and it is important for producers and manufacturers to work with them in order to maintain sustainable production and manufacturing processes.
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APPENDICES

Appendix 1: Transcribed Interview

Interview 1: Kamran Shoaib-Manager Development, ‘Alkaram Textiles’

Interviewed: 27th April 2013

Q: Where does your firm get its cotton from?

Q: Are any methods of sustainable production used in the process of manufacturing or producing goods that use cotton?

Q: How is sustainable production affecting your firm?

Q: How does it affect the production and manufacturing process?

Q: How cost effective is it?

Q: Effect on labour and resources-land, labour, capital, entrepreneur?

Q: Positive and negative effects of sustainable production?

The cotton produced in Pakistan is of a coarse count, the fabric required for production is mostly a fine count for the yarn. 40 count and above is imported and 80,60 is used for lawn. At the moment ‘Bukhari’ farms is the only farm which is producing a good quality count Pakistan Pakistans medium staple is cotton; you can mostly find it in lower and upper Sindh as well as Punjab where there is more water.

The ‘Better Cotton Initiative’ (BCI) provides training to farmers and uses less fertilizer to control soil and it also help cost production, there is more money and healthy crop, and unnecessary pesticide is tried to not be used. Environment cost reduces making the environment better and healthier.
The UN aims for poverty reductions and BCI production is started by them, it is practiced in India and Pakistan, China and recently in Bangladesh with a collaborative with the WWF. Other sustainable projects are on agriculture, sugarcane and cotton.

Cotton seeds characteristics are very important and at one time Pakistan used to have very good cotton growth. Unfortunately in Pakistan BT cotton was controlled and the quality of cotton school of Multan was very good- 40 count easily staple length 1.14 reduced to 1.09 and the quality fell, yarns quality and fineness reduced

This was because there was no controlled system and it was given to uneducated farmers who planted bad seeds and one plant had less no of balls yield per acre. Cotton had less weight, price was the same but less production per acre no incentive no motivation for farmers and land goes to waste eventually impacts production.

Alkaram does cotton field survey, corporate lawn is less, farming has now shifted to real estate in recent years, maybe urbanisation is making changes.

After the field survey there were healthy crops no attacks of pests and a lot of growth plus quality seed mixing can work sometimes.

In the spinning area ‘Eco diet product’ is used- prepared polyster fibre from china which are different shades mixed with cotton to prepare yarn weaving hence dye is not needed at all and water is also not needed.

Institution towels are used which have the advantages-fibre fixes the dye which means there is time saving and it is used for sheets.

Fibre mixes with cotton bleach and washes polymerisations and the dyeing process is eliminated.
Labour energy and time is saved.

Efuelent Treatment plants causes profit to reduce, it is about 6 lakhs approximately going to waste but Alkaram believes in commitment for masses. Because of this plant less chemicals are discharged like pigments and dyes because of efuelent treatment. Seas life will reduce if efuelent is not used because then oxygen reduction will take place and effect on marine life, soil, causes skin cancer.
Appendix 2: Online Interview

Interview 2: Bilal Nadeem, owner of Nadeem Industries.

Interviewed: 15th March 2013

Q) Where does your firm get its cotton from?
Ans) We’re a weaving unit. We require yarn from spinning mills in order to weave cloth, however, we don’t just stick to just one spinning mill. It all depends on the season and blend of cotton the spinner is using.

Q) Are any methods of sustainable production used in the process of manufacturing or producing goods that use cotton?
Ans) As far as sustainable production is concerned we try our level best to make sure that the production is as environment friendly as it could be. Our machines go through a routine maintenance every week so that it creates as little trouble for the weaver and the atmosphere within the unit. Exhaust system which has a filter installed in it are running all the time in the unit so suck in the moist, oil and cotton particles that is left in the air at the time of production so it is less effective to the environment inside and outside the unit.

Q) How is sustainable production affecting your firm?
Ans) Sustainable production has its negative as well as positive aspects. It affects our production as we have to shut down our department to make sure that the machines are under the non-polluting category meaning that all the parts and devices are working fine which also conserves energy. Our production is lost during the time our department is under going the survey, however, at the same time it as its benefits one of them being that
weavers feel satisfied and work in a more secure environment as far as health issues are concerned.

**Q) How does it affect the manufacturing process?**

Ans) Its affecting our production in a way that we don’t run our machines on their maximum capacity/ RPM as more dust and oil smoke is produced by doing so. Lets say if we can produce 150 meters of cloth on one loom in 12 hours, we’re producing 140 meters instead as less affective to the environment.
Appendix 3: Phone Interviews

Interview 3: Nadeem Abdullah, owner ‘Sapphire Textile Mills’

Interviewed: 29th April 2013

Notes taken:

Q: Where does your firm get its cotton from?

Q: Are any methods of sustainable production used in the process of manufacturing or producing goods that use cotton?

Q: How is sustainable production affecting your firm?

Q: How does it affect the production and manufacturing process?

Q: How cost effective is it?

Q: Effect on labour and resources-land, labour, capital, entrepreneur?

Q: Positive and negative effects of sustainable production?

- Majority consumption is of Pakistani cotton, however, there are limitations due to contamination. Hence, cotton may be imported from-U. S, Brazil, Greek, Spin finer counts.

- 800,000 cotton mills in lower Sindh and Punjab Tandolayer, Khanawal. Opened factory in Lower Sindh, in Nooriabad.

- Sapphire sells yarns, grey fabrics, and trousers, dye and sell to Levis, Dockers, home textile, breech fabrics.

- Raw cotton is now mostly organic cotton, due to the better cotton initiative (BCI)-protection methods-no child labour-fair wages of workers, less workers, less pesticide, come and train farmers under BCI.
Factories working with BCI, organic, have to have certification- special compliance. FA8000 which consists of processing, water treatment plants

Sapphire is the only mill in the country certified by EU flower, keeping European standard.

The factory id provided with central sections, filtration systems. Dust etc, sucked in and goes to central room so not affecting environment

All departments have air changes, comfort for workers

Earplugs provided to avoid noise pollution.

If the workers are happy then the work is also better.

Old machinery required a lot of space and labour whereas new machinery requires less space and labour and produces 100kg/hour. Before it was 10/kg/hour.

Overall more efficient.

Every year new machinery, constant improvement, quality, productivity.

Chinese technology-Sapphire goes for best technology-automotive.

Very positive-New processing unit

Environment friendly equipment

Expansion processing plant

Cold boilers were used before but now Biomass boilers are used.

Compared to cold boilers price is 4 times higher.

Cold boilers are local-cheaper-not environmentally friendly.

Water treat and discharge-agriculture, water should be re-used.
Interview 4: Wajeed Ali, owner ‘Kasim Textiles’

Interviewed: 1st May 2013

Notes taken:

Q: Where does your firm get its cotton from?

Q: Are any methods of sustainable production used in the process of manufacturing or producing goods that use cotton?

Q: How is sustainable production affecting your firm?

Q: How does it affect the production and manufacturing process?

Q: How cost effective is it?

Q: Effect on labour and resources-land, labour, capital, entrepreneur?

Q: Positive and negative effects of sustainable production?

- Organic cotton not grown in Pakistan-BCI is now introducing it along with Reel Cotton- India, Cleaner Cotton-America.-Non organic used as well
- Generators are used in the mill for air-conditioning, dyes, chemicals not harmful to human beings-treatment of the effluent water plant.
- Production-cotton is expensive, chemicals are expensive, yarn, dyeing, packing separately.
- Certification not required, buyers gives price, sustainable production is done if the buyers are multinational then they sponsor sustainable production methods-Levis, H&M, Zara, Aeropostle, Marks and Spencer. These sponsor Kasim textiles and mostly retail outlets sponsor the mills for sustainability.
• Labourers are provided with ear-plugs (in weaving) there are ducts where waste collects, masks are provided for the workers and filtered water.

• Resources—land—their own.

• BCI has been working in Pakistan since past three years, cultivation cotton—helping farmers, gin cotton, trying definitely to go into the field.

• Sustainable cotton is also called fair trade cotton.

• Very small quantity in Balochistan, bad conditions unable to go there.
Interview 5: Rizwan Zafar-Mills Manager, ‘Alkaram Textile Mill’

Interviewed: 27th April 2013

Notes taken:

Q: Where does your firm get its cotton from?

Q: Are any methods of sustainable production used in the process of manufacturing or producing goods that use cotton?

Q: How is sustainable production affecting your firm?

Q: How does it affect the production and manufacturing process?

Q: How cost effective is it?

Q: Effect on labour and resources-land, labour, capital, entrepreneur?

Q: Positive and negative effects of sustainable production?

- Coarse count fine count
- Swiss made plant/meter two lines-40 count and 30 count
- Lower AC plant, dust system reduced, all removed from department, reduced labour cost, machine cost.
- Temperature-46 degrees hence a.cs are on all the time workers-water, every 50 minutes break.
- Sound pollution-90-96 decibel standard recommended by ISO
- Some workers don’t use ear plugs, etc due to lack of education.
- Wal-Mart and Ikea-ISQS standards apply.
- 90% hazard is from dust, short fibre-spinning
• Process from cotton to yarn, unwanted fibre and trash, filter-sucks the air out, and it goes to waste, this is recycled.

• Recycled-fibre made from waste cotton-more waste in some cotton less in others.

• Coarse cotton used for rugs, lesser count.