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BACHELOR'S THESIS

2009

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HOGESCHOOL INHOLLAND UNIVERSITY OF APPLIED SCIENCES
EUROPEAN BUSINESS ADMINISTRATION DEGREE PROGRAMME

ECO-FAHSION, A TREND OR COMMERCIALY SUSTAINABLE FUTURE?

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EBA05/IBMS
Dissertation
May 2009

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1. Preface

This report has been written as part of the fourth year International Business and Management Studies curriculum at the Hogeschool INHOLLAND, school of Economics, Amsterdam/Diemen, the Netherlands. Being a bachelors thesis, it is a requirement for a fourth year student for the completion of its education.

This report has been written for all interested in the subject of sustainable development, its concept in relation to the green trend and its implementation within the apparel industry. Illustrating the basic apparel supply chain and Eco-fashion's interpretation, eventually seeking to combine the efforts of CSR with commercialization.

Finally, I wish to acknowledge the help of Mr. Keany, for the inspiration that he provided in the initial phase of the writing of this report, during the first semester of the fourth year in Finland. And acknowledge the help of Mr. Denz, for his consultation leading to the successful completion of this report, during the second semester of the fourth year in the Netherlands.

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4. Executive Summary

This dissertation discusses the concept of Eco-Fashion, with the main question being whether the concept is just a trend or has a commercially sustainable future. This question arises because of the implications in relation to the implementation of sustainable development throughout the complete apparel supply chain. Sustainable development is a concept that evolves around three pillars, environmental, social, and economical sustainability, which are all to be implemented throughout each level within the apparel supply chain for the realization of Eco-fashion.

Environmental sustainability seeks for the balancing of the ecosystem. In which all natural resources used for production should be replaced at an equal or even higher rate, without any negative influence upon the environment. This being achieved within the concept of Eco-fashion through organic cultivation. Cultivation without the usage of pesticides and insecticides, or any genetically modified seeds. Conventional cotton cultivation accounts for 25% of the world's insecticide and 10% of the world's pesticide usage, whilst covering 2.4 of the world's arable land. Further along the supply chain the concept is implemented through utilization of natural dyes, water management and waste management, with continuous R&D seeking environmental substitutes.

Social sustainability evolves around social capital, in which it is important to take all stakeholders into account which are involved in the production process. Which in Eco-fashion can be recognized through the implementation of concepts such as fair-trade, a farmer receiving a fair payment for their cotton with an additional premium for communal purposes, such as education and healthcare. Throughout the supply chain the concept is implemented through management systems such as the Social Accountability 8000 system, looking at standardization of fair working conditions and clean a working environment.

Economical sustainability looks at renewability of resources utilized in the production process. Additionally the maintaining of one's capital, renewability to be achieved through profit/surplus. Fair-trade represents economical sustainability within Eco-fashion.

Certification of sustainable development by corporations exist in both governmental and NGO level. Providing a company with a source for proof of their sustainable intent. To be utilized on retail level as marketing tool, a source for competitive advantage selling a product through its sustainable value adding background.

Looking at the PESTEL factors Eco-fashion is assured of political backing, with the EU providing consultation, but freedom in standardization and certification by NGOs. The economical environment is categorized by a crisis, but consumers maintain conscious about the need for CSR, with a high level of consumer awareness and association on sustainable development.

However commercialization is driven by corporate initiative. Through the combination of a consumer pull and corporate push a commercial market is established for Eco-fashion. Nonetheless, great collaboration with NGOs is necessary for combining sustainable development and its implementation throughout the apparel supply chain whilst maintaining a commercial focus seeking profitability.

5. Terms and Abbreviations

B2B	Business-to Business
B2C	Business-to-Consumer
BT Cotton	Genetically modified cotton containing Bacillus thuringiensis a bacteria creating a toxin within the plant that functions as insecticidal
CNTAC	China National Textile and Apparel Council
CSC9000T	China Social Compliance 9000 standards for textile and apparel industry
CSR	Corporate Social Responsibility
EC	European Commission
Externalities	Public consequence of a private decision
FLO	Fairtrade Labelling Organization International
GM	Genetically Modified
ILO	International Labour Organization
IUCN	International Union for Conservation of Nature
NGO	Non Governmental Organization
NPM Cotton	Non Pest Management Cotton

OE	Organic Exchange
Rs	Indian Rupee
RSCA	Responsible Supply Chain Association
SA8000	Social Accountability 8000 system, a international ethical workplace management system
SAI	Social Accountability International
SCP	Sustainable Cotton Project
Sustainable development	Environmental, Social, and economical development
UN	United Nations
USDA	United States Department of Agriculture
WCA	West and Central Africa

6. Introduction

A green trend has occurred over the past years leading to an increased level of CSR being implemented by corporations. This trend has been taken over by the apparel industry in the form of Eco-fashion. This concept however seeks to achieve sustainable development throughout its supply chain, a complicated process leading to the questioning of its commercial sustainability.

In the following chapters the concept of Eco-Fashion will be discussed. Looking upon the concept of sustainable development and the implementation of sustainability within Eco-fashion. Analyzing these concepts working towards establishing a relationship between Eco-fashion and commercialization. In which the focus will lay upon the concept of Eco-Fashion as being part of the apparel industry, how the concept of Eco-fashion influences the apparel supply chain, and whether commercialization is achievable while implementing Eco-fashion.

7. Research Questions

- ***Eco-fashion, a trend or commercially sustainable future?***

The main dissertation question focussing upon the core of the problem. Whilst implementing the concept of sustainable development is a commercial venture achievable? Does it commercially prove beneficial to implement such level of CSR?

- ***Can Eco-fashion compete with the disposable culture of Fast-fashion?***

A sub question comparing the concept of Eco-fashion to the competitive environment. Looking at whether an attractive market is existent for seeking a commercial venture.

- ***How can the Eco-fashion industry best utilize external forces to its advantage?***

As Eco-fashion seeks sustainable development, close relations are to be established throughout the supply chain, in order for optimal sustainability to be achieved. Which forces may best attribute to the commercial success of Eco-fashion?

8. Methodology

In order for the dissertation questions to be successfully answered, sufficient sources of information are to be gathered for establishing the commercial ability of the concept of Eco-fashion within the current environment.

It is important to first establish the concept of Eco-fashion and what evolves around the implementation as such. Sources as the Fairtrade Labelling Organization International (FLO), International Labour Organization (ILO), and Organic Exchange (OE), are those whom create standardization of the concept, functioning as the basis of the report.

Strategic management books provide basis for research and analysis through theory in relation to analytical models for the analysis of both the external and internal market conditions.

Due to the current nature of the subject most information is derived from secondary research. Levels of sustainability within Eco-fashion organizations are sourced from annual reports and company websites, publications in relation to CSR. As is commercial potential, analyzing research on costs related to implementation of the concept.

Surveys published on the internet are used to establish the impact of the concept upon society, defining whether it would prove commercially attractive, defining customer demand.

Web articles have been a major source for establishing essential changes within the market environment and competitive strategic approaches of Eco-fashion corporations.

9. Eco-Fashion, a trend or commercially sustainable future?

Looking at commerce and its goal of trade between producer and consumer, in which it seeks to achieve profit/surplus through the process of commercialization, the question arises whether a company seeking a commercial venture can achieve its goals while utilizing the sustainable Eco-Fashion concept?

Eco-fashion definition according to Bono, lead singer of U2, whom together with his wife, Ali Hewson, set-up an Eco-Fashion brand called Edun. *"It's different. At the very heart of it is the idea of four respects: respect for what your clothes are made of, respect for who is making them, respect for where they are made and respect for the people who are going to put them on."* (Bono, during launch of Eco-fashion brand Edun)¹.

The exploitation of Eco-Fashion is currently being implemented on micro level by SMEs and sometimes in smaller quantities by the bigger retail chains such as Wal-Mart (USA), C&A (Belgium), and H&M (Sweden). The main reason for this being that the concept of Eco-fashion increases costs throughout the apparel supply chain. E.g. the raw material organic cotton is more expensive, 20 to 30 percent more, and the supply is still low with 0.55 percent of the world's cotton production in the year 2007/2008.²³ The manufacturing process should be conducted in a healthy and safe environment with working conditions being up to globally accepted standard and at a fair wage. And those are just some of the aspects within the supply chain of Eco-fashion that differentiates it from a conventional apparel supply chain.

¹ Gershon Joel, "Wearing your values: Eco-fashion on today's runway", E - The Environmental Magazine, Jul/Aug, 2005, Vol. 16 Issue 4, p56-166

² [http://www.fairtrade.net/single_view1.html?&cHash=a3c7a90d29&tx_ttnews\[backPid\]=614&tx_ttnews\[painter\]=3&tx_ttnews\[tt_news\]=42](http://www.fairtrade.net/single_view1.html?&cHash=a3c7a90d29&tx_ttnews[backPid]=614&tx_ttnews[painter]=3&tx_ttnews[tt_news]=42)

³ http://www.organicexchange.org/Documents/press_08fiber.pdf

Nonetheless a distinction should be made between different types of sustainable Eco-fashion initiatives. In which two categories can be recognised; A NGO-initiated operation with the primary objective of contributing to sustainable development; and initiatives that are business oriented but seek to contribute to sustainability.⁴ Looking at the dissertation question, the focus seems shifted to the business orientation, however throughout the report will become clear that a thin line exist between both initiatives and that often they are interdependencies of one another.

9.1 Apparel Supply Chain

For the analysis of the concept of Eco-fashion it is important to look at the supply chain of the apparel industry and with it its value adding process. How is this altered within the concept of Eco-fashion, and does a commercial venture prove profitable with a differentiated supply chain? In order to answer these questions a basis of the apparel supply chain is to be illustrated.

Looking at the supply chain within the apparel industry it is important to analyse all aspects contributing to the manufacturing of the final product. In which each individual level within the supply chain would have their own unit level. In other words, in which all steps of the supply chain have their own value chain contributing to their practices.

As one can see from the complete supply chain of the apparel industry, many aspects attribute to the final product. (See figure 1) One should analyze the pictured supply chain as being two separate entities, in which the bottom comprises of the total spread of the apparel supply chain and the top consists of each individual inbound activities of an organization's link within the total supply chain.

⁴ <http://www.fairtrade-advocacy.org/images/communfairtrade.pdf>

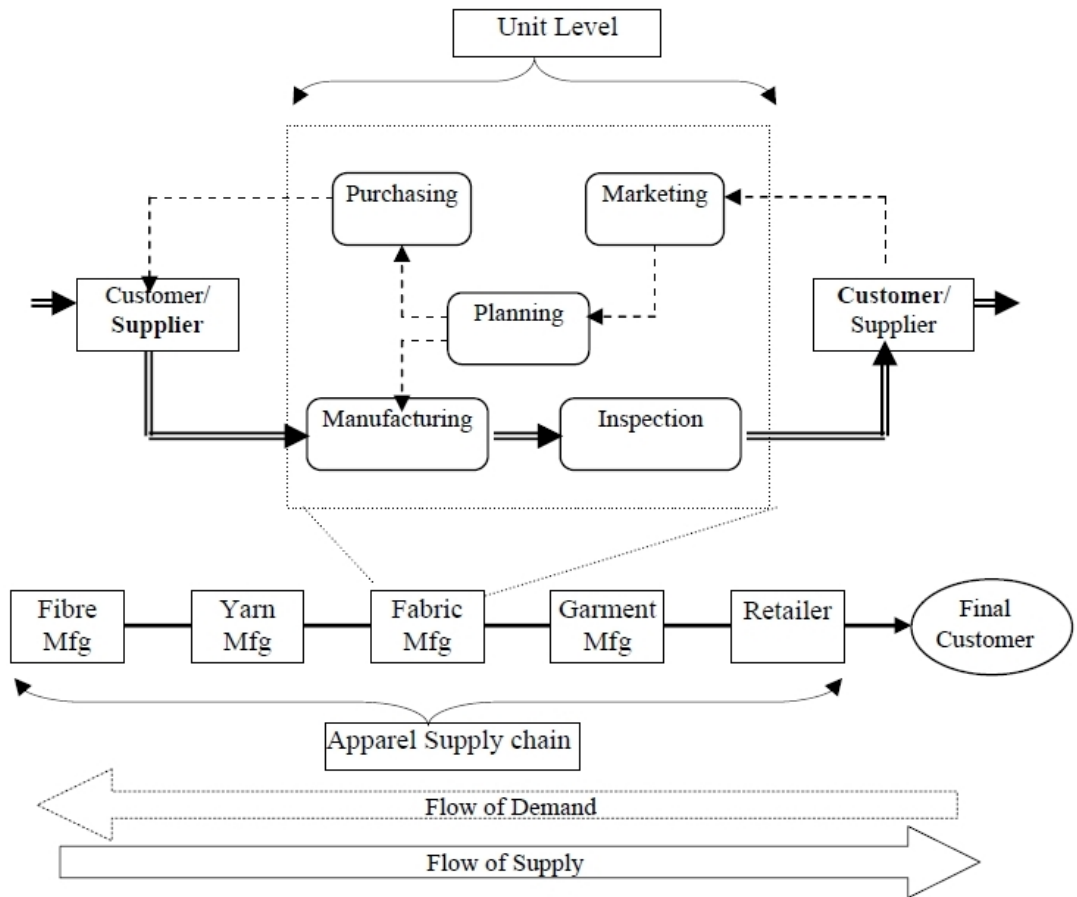


Figure 1 Apparel Supply Chain⁵

Looking at the top entity of this supply chain, one can recognise the general value chain activities of an organization:

- **purchasing**, procurement of raw materials as support activity
- **Manufacturing**, operations surrounded by inbound and outbound logistics as part of the primary activities
- **Inspection**, these functioning as control of output
- **marketing**, another primary activity generally coexisting with sales

⁵ <http://www.fibre2fashion.com/industry-article/11/1067/apparel-supply-chain-and-its-variants2.asp>

- **Planning**, the centre of an organization seeking efficiency in order to achieve SCA, leading to profitability

Looking at the bottom entity, the complete apparel supply chain can be recognised:

- **Fibre Manufacturing**, e.g. cotton, hemp, jute fibres. The actual cultivation of the raw material for the manufacturing of a fabric.
- **Yarn Manufacturing**, before a fabric is created first the fibre is spun for the creation of yarn after which the combining of yarns leads to the creation of fabric. Yarn does also function as thread for the actual sowing of the fabrics into a garment.
- **Fabric manufacturing**, from the yarn that has been spun of the fibre, the actual fabric is being created. In this process dyeing is also included for the colouring of the fabric.
- **Garment manufacturing**, the final stage in the creation of a clothing piece, in which the fabrics and yarn, for sowing together the fabric, is used for the manufacturing of the actual garment. This might also include printing of some sort upon the garments itself.
- **Retailer**, the retailer might be a local clothing shop or greater retailers such as Wal-Mart or C&A, or maybe even online clothing stores. Between retailer and manufacturer there might often be an additional level, wholesalers or distributors, selling the clothing to the final retailer.

As all steps within the supply chain are described, it should be taken into account that all these steps have their own internal practises as described above as being the top entity. In which all organizations might be separate privately owned or part of one bigger corporation having vertically integrated.

This illustrating the basis of the apparel industry which should lead to better understanding the concept of Eco-fashion and how this is being integrated throughout the supply chain. And which impacts this concept might have upon a transition from a more conventional supply chain to Eco-fashion. Furthermore, as the research question focuses upon the commercial capacity of the concept of Eco-fashion, it is import that the value adding process is being analysed with the implementation of such strategy and how this might affect one's commercialization. Whether this provides a major increase in costs or if it still remains profitable? Proving not only to be sustainable in an environmental, social and economical manner but also commercially.

10. Eco-Fashion

10.1 Introduction

In order for the concept of Eco-fashion to be analysed for its commercial ability, it is important to distinguish what it is that defines the concept of Eco-Fashion. This chapter will focus upon the concept of sustainable development and how this has been integrated throughout the supply chain of Eco-fashion.

10.2 Sustainability

The actual term sustainability was first implemented by putting it in front of the term development, Sustainable Development, during the 1972 United Nations Conference on the Human Environment in Stockholm.⁶ Which was later defined in 1987 by the Brundtland Commission as being, "*development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*"⁷ Meaning for it to be a goal, in which sustainability seeks to achieve a set target without negatively influencing the future.

While the discussion on the rightful implementation of the term continues, the term is commonly represented by three pillars; environmental, social and economic sustainability. These can be seen as separate entities proving one's priority over implementation of one of the pillars or combined as one's goal of reaching an integrated form of sustainability. As illustrated hereafter one can recognize that the pillars are interconnected, the new symbol being utilized by the International Union for Conservation of Nature (IUCN) in 2005.⁸ (See Figure 2)

⁶ Adams, W.M. (22 May 2006): "The Future of Sustainability: Re-thinking Environment and Development in the Twenty-first Century" Report of the IUCN Renowned Thinkers Meeting

⁷ United Nations.(11-12-1987): "Report of the World Commission on Environment and Development" General Assembly Resolution 42/187

⁸ Adams, W.M. (22 May 2006): "The Future of Sustainability: Re-thinking Environment and Development in the Twenty-first Century" Report of the IUCN Renowned Thinkers Meeting

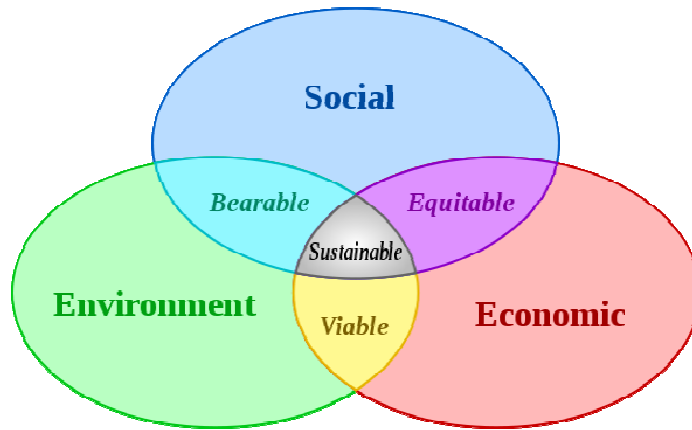


Figure 2 Sustainable Development⁹

⁹ Adams, W.M. (22 May 2006): "The Future of Sustainability: Re-thinking Environment and Development in the Twenty-first Century" Report of the IUCN Renowned Thinkers Meeting

10.3 Environmental Sustainability

From an environmental view sustainability stands for the ability of the ecosystem to maintain its processes, functions, biodiversity and productivity now and in the future. Meaning, for every natural resource used a replacement should be provided, leading to a balance in which the current x will remain the same x in the future. In which the level of externalities affecting the environment should remain zero, or to be replaced at an equal or higher rate.¹⁰

Conventional cotton cultivation represents one of the biggest users of chemicals within the agricultural sector, utilizing 10% of the world's pesticides and 25% of the world's insecticides, this while only utilizing 2.4% of the world's arable land. Hazardous for people, wildlife, and environment.¹¹ Environmental sustainability within the concept of Eco-fashion is therefore realized through the implementation of organic cultivation, utilizing organic cotton.¹² This being the first step within the apparel supply chain, cultivation and fibre manufacturing.

Organic cotton is distinguished by a couple of aspects that follow rules and regulations of the European Commission (EC), Council regulation (EC) No 834/2007 and its amendment Council regulation (EC) No 976/2008.¹³ Or equally the rules stated by the United States Department of Agriculture (USDA) or any other guidelines being distinguished by country regulation.¹⁵

The European Union (EU) does furthermore provide an Eco-label, this can be linked to any type of household application as well as clothing. This label evolves around production criteria, in relation to for instance dyeing, water use, chemical use etc. Within the range of clothing both shoes and

¹⁰ Serageldin I, Steer A (1994): "Valuing the Environment: Proceedings of the First Annual International Conference on Environmentally Sustainable Development" World Bank Report Number 13520: 45

¹¹ <http://www.panna.org/files/conventionalCotton.dv.html>

¹² Appendix I - Organic Cotton Cultivation

¹³ European Commission (28-06-2007): "Organic production and labelling of organic products and repealing Regulation (EEC) No 2092/91" Council regulation (EC) No 834/2007

¹⁴ European Commission (29-08-2008): "amending Regulation (EC) No 834/2007 on organic production and labelling of organic product" Council regulation (EC) No 976/2008

¹⁵ <http://www.ams.usda.gov/AMSV1.0/ams.fetchTemplateData.do?template=TemplateA&navID=NationalOrganicProgram&leftNav=NationalOrganicProgram&page=NOPNationalOrganicProgramHome&acct=nop>

textiles are included, which also includes 4 different types of textiles next to cotton; acryl; eglantine; bast fibres (inc jute, hemp, and ramie); and wool.¹⁶¹⁷

Wide crop rotation is one of the organic cultivation elements, in which multiple types of crop are being cultivated upon the same piece of land. No one consecutive season will have the same crop, as each season the type of crop is rotated and a new crop will be cultivated upon the piece of land. As one year the land might harvest organic cotton and the next season the farmer would choose to cultivate organic soybeans.

The reason for crop rotation is to reduce possible pests of developing and for maintaining the soil's fertility. As some crop might require a certain nutrition from the soil another crop will require a different type of nutrition, therefore providing the soil with the ability to rebuild its strength and enabling it to once more provide additional nutrition of a different type. A similar effect applies to pests, as different crop might attract different pests and rotating the crops will reduce the risk of obtaining pests within the cultivation process.¹⁸

Non utilization of chemical synthetic pesticides, insecticides, and artificial fertilizers are another part of organic cultivation.¹⁹ For chemical synthetic pesticides have proved to cause major damage to the environment; polluting air, water, soil ,and other crops surrounding the field that has been treated with a pesticide. Pesticides might even end up causing severe health problems to those that have been exposed to them, endangering the farmer's health.²⁰

¹⁶ http://ec.europa.eu/environment/ecolabel/product/pg_clothing_textiles_en.htm

¹⁷ Appendix II – Check List European Eco-label for Textiles

¹⁸ http://ec.europa.eu/agriculture/organic/organic-farming/what-organic_en

¹⁹ http://ec.europa.eu/agriculture/organic/environment/soil_en

²⁰ McCauley LA, Anger WK, Keifer M, Langley R, Robson MG, and Rohlman D (June 2006). "Studying health outcomes in farmworker populations exposed to pesticides" *Environmental Health Perspectives* 114: 953–960

A substitute for these chemicals are natural pesticides, insecticides, and fertilizers. Which contain naturally derived insecticidal properties.²¹ Fertilizers are often derived from cow dung, e.g. Panchakavya.²² Providing the farmer with not only a organic substitute, but also a cheaper substitute as on average the costs of an organic farmer in relation to pest control are one fifth of that of his non organic competition.

As illustrated in the case of the Indian farmers utilizing Non Pest Management Cotton (NPM Cotton), spending Rs 382 (Indian Rupee) per acre in comparison to their BT Cotton (Genetically Modified cotton seeds) utilizing competitors spending Rs 2632 per acre. A difference of 690%. BT Cotton does furthermore provide an increase in costs in relation to the costs of the seed per acre, as BT cotton is 355% more expensive than its NPM Cotton counterpart.²³ Providing clear evidence of a commercial benefit for the farmers involved in the first stage of the Eco-fashion supply chain, furthermore because differences exists in the gross profit margin when comparing a conventional to a organic cotton farmer.²⁴

The actual effectiveness of both cultivation approaches does show major differences in which the NPM cotton is more superior in the lack of occurrences of harmful insects.(See figure 3) Furthermore, with a lower level of incidence in relation to pesticides.(see figure 4) And as a result an increased amount of numbers of beneficial insects within the NPM cotton cultivation.(see figure 5) This being a major strategy of the NPM farmers' pest control, for their aim is for beneficial insects, whom by definition natural predators of cotton pests, to reduce pest incidence.²⁵

²¹ <http://www.planetnatural.com/site/xdpy/kb/natural-pest-control.html>

²² <http://digitaljourno.wordpress.com/2008/06/03/green-farming-diy-organic-fertilizer-and-pesticide/>

²³ <http://www.i-sis.org.uk/OCBBCI.php>

²⁴ See 11.3 Economical

²⁵ <http://www.i-sis.org.uk/OCBBCI.php>

Level of incidence	Spotted Bollworm		American Bollworm		Tobacco Caterpillar		Pink Bollworm	
	Bt cotton	NPM cotton	Bt cotton	NPM cotton	Bt cotton	NPM cotton	Bt cotton	NPM cotton
High	15 (12.8)	4 (3.3)	38 (32.5)	5 (4.1)	8 (6.8)	2 (1.7)	20 (17.1)	25 (20.7)
Medium	23 (19.7)	18 (14.9)	59 (15.4)	24 (19.8)	34 (29.1)	22 (18.2)	67 (57.3)	57 (47.1)
Low	77 (65.8)	93 (76.9)	20 (17.1)	92 (76.1)	75 (64.1)	93 (76.8)	29 (24.8)	38 (31.4)
Nil	2 (1.7)	6 (4.9)	0 (0)	0 (0)	0 (0)	4 (3.3)	1 (0.8)	1 (0.8)

Figure 3 Incidence of Bollworm complex on BT and NPM cotton²⁶

(A total of 117 BT and 121 NPM farmers, text in brackets represents percentage of total)

Level of incidence	Jassids		Thrips		Whitefly		Aphids		Mites	
	Bt	NPM	Bt	NPM	Bt	NPM	Bt	NPM	Bt	NPM
High	52 (44.5)	7 (5.8)	1 (0.8)	0 (0)	39 (33.4)	2 (1.6)	35 (29.9)	1 (0.8)	21 (17.9)	3 (2.5)
Medium	42 (35.9)	20 (16.5)	21 (17.9)	8 (6.6)	35 (29.9)	15 (12.4)	43 (36.8)	20 (16.6)	45 (38.6)	10 (8.3)
Low	22 (18.8)	94 (77.7)	92 (78.7)	107 (91.5)	41 (35.0)	90 (74.4)	39 (33.3)	95 (78.5)	50 (42.7)	101 (83.5)
Nil	1 (0.8)	0 (0)	3 (2.6)	6 (4.9)	2 (1.7)	14 (11.6)	0 (0)	5 (4.1)	1 (0.8)	7 (5.7)

Figure 4 Incidence of sucking pests on BT and NPM cotton²⁷

(A total of 117 BT and 121 NPM farmers, text in brackets represents percentage of total)

²⁶ <http://www.i-sis.org.uk/OCBBCI.php>

²⁷ <http://www.i-sis.org.uk/OCBBCI.php>

Incidence level of beneficial insects	Bt Cotton Fields	NPM Cotton Fields
High	0 (0)	85 (70.2)
Medium	7 (5.9)	26 (21.5)
Low	97 (82.9)	8 (6.6)
Nil	13 (11.2)	2 (1.7)

Figure 5 Incidence of beneficial insects on BT and NPM cotton²⁸
(A total of 117 BT and 121 NPM farmers, text in brackets represents percentage of total)

Looking at the apparel industry, multiple environmental hazards can also be recognized further along the supply chain. With the cotton fibre being processed into yarn, as the fibre is boiled, bleached and washed before it can actually be utilized for fabric manufacturing. Furthermore, treatments in the processing of the fabric involve dyeing, which includes the utilization of a lot of water and chemicals.²⁹ In relation to this dilemma, alternatives are being created in sense of waste reduction, water management and environmentally-friendly colouring.³⁰³¹

Rules and regulation play an important role in the approval and certification of a farmer's organic practises within the EU. Similar rules and regulations apply throughout the world, providing local farmers there their own certification and approval for use of a organic trademark.

A trademark specifically created for the cultivation of organic cotton has been created by Organic Exchange (OE), a American based charitable organization that has as goal expanding organic fibre cultivation with 50% per year on a world wide scale.³²

A Dutch alternative to this initiative is called Made-By, a initiative from the organization Solidaridad.³³ Made-By focuses upon sustainability throughout the complete supply chain of

²⁸ <http://www.i-sis.org.uk/OCBBCI.php>

²⁹ <http://www.made-by.nl/infoshow.php?ih=3&is=6&lg=en>

³⁰ Made-By (May 2008): " , Made-By goes international" Made-By Annual report 2007: 18

³¹ See 11.5 Technological

³² <https://www.organicexchange.org/mission.php>

³³ <http://www.solidaridad.nl/merken/made-by>

fashion brands. With their mission of making Eco-fashion common practise.³⁴ Both organizations, Organic Exchange and Made-By, have now worked together on setting-up a seminar on sustainable fashion and how to best implement this within your organization. The conference relates to all sorts of topics regarding sustainability within one's supply chain.³⁵

Logistics are also to be confronted throughout the supply chain with the need for environmental sustainability. Of course emission are not able to be abolished but standards are being created in relation to the maximum level of such. The EU has European guidelines on this level, to be recognised in the Euro 5 and Euro 6 standards. These have evolved throughout the years, starting with the Euro 1 standard in 1992. The most recent standard, Euro 5 and 6, look upon an even lower Co2 emission throughout all forms of transportation varying from personal cars to transport truck. These standards help sustain and decrease emission within the EU, working towards more environmentally friendly transport.³⁶

³⁴ http://www.made-by.nl/madeby_missie.php?lg=en

³⁵ http://www.made-by.nl/bedrijven_seminar.php?lg=en

³⁶ <http://europa.eu/scadplus/leg/en/lvb/l28186.htm>

10.4 Social Sustainability

In a social context the emphasis lies on achievement of one's current and future needs. Looking at Eco-Fashion this is to be realized through fair-trade. Providing cotton farmers with economic self sufficiency and a sustainable future.³⁷

Furthermore a focus is put upon the production of garments and what type of conditions exist within factories. Providing more rights to the workers within the factories, allowing them to set-up a workers union. Providing equal rights between men and women. Not allowing any form of child labour. And for the working conditions to be healthy and safe. A level of working conditions that is equal to that opposed by Social Accountability International (SAI), more specifically the Social Accountability 8000 (SA8000) system.³⁸ The SA8000 system is based upon the International Labour Organisation (ILO) standards and United Nations (UN) Human Rights Conventions, therefore being widely accepted as the most practical and complete international ethical workplace management system.³⁹

The China Social Compliance 9000 (CSC9000T) standard for the textile and apparel industry is its Chinese equivalent.⁴⁰ Being a collaboration between the China National Textile and Apparel Council (CNTAC) and the Responsible Supply Chain Association (RSCA), it is a standard similar to that of the SA8000 but specifically generated and focussed upon the textile and apparel industry within China. In which the textile industry involves fibre, yarn and fabric manufacturing, and the apparel industry relates to the actual garment manufacturing.

³⁷ http://www.fairtrade.net/what_is_fairtrade.html

³⁸ <http://www.sa-intl.org/index.cfm?fuseaction=Page.viewPage&pageId=473>

³⁹ <http://www.sa-intl.org/index.cfm?fuseaction=Page.viewPage&pageId=472>

⁴⁰ http://www.csc9000.org.cn/en/AboutCSC9000T_Detail.asp?DID=232

Solidaridad, together with Made-By, also plays a major role in the implementation of social sustainability when it comes to sustainable fashion. As the focus does not only restrict itself to the cultivation of organic cotton or the production process, but also looks at the social environment surrounding those involved within the supply chain. Facilitating healthcare and schooling for all involved within the community.⁴¹ This is part of the Fairtrade Labelling Organization International (FLO) standards on the cultivation of cotton. As part of the fair-trade cultivation of cotton farmers get paid a minimum per Kg for their cotton, exclusive the additional premium of 0,05-0,06 US\$/Kg which is paid to the farmers for social and economic investments. Such investments consist of education, health services, processing equipment, and loans to members of the community.⁴² Keeping in mind that sustainability focuses upon the future, in which Solidaridad's premium payment may be seen as an investment in the future.

Another form of financial support from the FLO is recognised in the possibility for farmers to request partial payment in advance, a loan providing up to 60% of the total production output price. Enabling farmers with the possibility to obtain initial capital as part of their investment before initiating the actual cultivation.

All social sustainability factors stated above do not only benefit the employees, for it leads to a increase in motivation, productivity and a decrease in illness and absence amongst employees. In the long run therefore leading to an increased output and efficiency, illustrating social sustainability's commercial benefits.

⁴¹ <http://www.solidaridad.nl/katoen/eerlijke-kleding-uit-china>

⁴² <http://www.fairtrade.net/cotton.html>

10.5 Economical Sustainability

For the economical analysis of a sustainable company the emphasis lies on renewability. For a company is to utilize renewable resources/commodities, at a rate in which the resources used in its production process should be replenished at an equal or even higher level. Furthermore, to retain capital, as is defined to consume value-added interests, rather than capital. ⁴³

With the implementation of crop rotation within the concept of organic cultivation renewability is achieved after the harvest. As no pesticides and insecticides are used, and the cotton has been harvested, a clean piece of land is left for the farmer to utilize for another crop to be cultivated. A crop that might utilize different fertility aspects of the soil, creating the ability for the soil to replenish and rebuild its strength for a new season with yet another new crop to be organically cultivated. A constant creation of renewability of the soil's capacity.

Next to economical advantages of the soil, clear economical advantages are also provided on the level of output in relation to the price/Kg for the cultivated cotton. An example of such can be found in the differences within the local price levels of organic cotton in Senegal and Mali.(see Figure 6) It can be recognised that Eco-fashion proves commercially sustainable and even more profitable for farmers. ⁴⁴

⁴³ <http://www.wiley.co.uk/egec/pdf/GA811-W.PDF>

⁴⁴ <http://www.fairtrade.net/cotton.html>

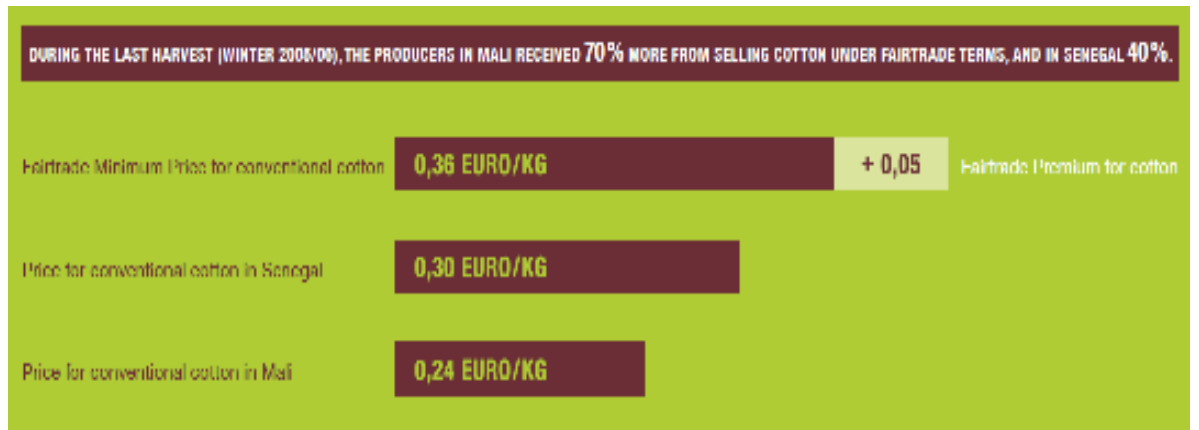


Figure 6 FLO Cotton Pricing Mali and Senegal 2005/06⁴⁵

Similar sustainability, as the fair-trade farmers stated above, should be achieved within the actual production process. In which working conditions should meet SAI 8000 standards. Providing the ability for all employees to earn a decent living, for them to be able to obtain primary goods.

⁴⁵ Fairtrade Labelling Organization International (2007), "Annual Report 2006/2007", Bonn, Germany

10.6 The Implementation of Eco-fashion

Summarizing all that is stated above in relation to sustainability, one can obtain a clear view of what Eco-fashion evolves around. As the concept focuses on all three pillars that are included in the concept of sustainable development and tries to best integrate these in achieving sustainable fashion.

Nonetheless it is not defined that the concept of Eco-fashion is compelled to implement all pillars of sustainable development. Having some brands utilize organic cotton without the further implementation of an environmental friendly production process as they might utilize chemicals for the dyeing process. Or others might utilize fair trade materials, focussing upon the social aspect of sustainability, but still the environment might be neglected during the garment production.

Therefore making it difficult to distinguish the different levels of implementation of sustainability when it comes to Eco-fashion. Organizations such as Organic Exchange and Made-By help create a global standard for the implementation of the term Eco-fashion. Providing a clear distinction between perceived sustainability and the actual implementation of such by companies. With their label and its standards, making it clear for consumers what it is they are buying and what it is they are supporting.

But the fact that support for the concept has become popular over the years has become clear from the most recent report from Organic Exchange, in which is stated that global retail sales of organic cotton apparel and home textile products have reached an estimated \$3.2 billion in 2008. A 63% increase from the \$1.9 billion market in 2007. Top ten global retailers were Wal-Mart (USA), C&A (Belgium), Nike (USA), H&M (SE), Zara (Spain), Anvil (USA), Coop Switzerland, Pottery Barn (USA), Greensource (USA), and Hess Natur (Germany).

Having analyzed the concept of sustainability and the willingness from corporations, in which collaborations between NGO and the commercial apparel industry have been established, shows already a clear increase in the implementation of the concept. Showing for the concept not to be just a trend, for an increase in output illustrates belief in sustainable commercialization. The idea behind Eco-fashion becoming a view in which it is the awareness of corporations to build upon a sustainable future, as environmental, social, and economic aspects involved within the supply chain are being paid more attention. Therefore in this perspective it is not as much a pull from the consumer side for the need of sustainability but the push of awareness of corporations for the creation of sustainability.

However this does not mean a pull from the consumer side does not exist, for a recent survey by GlobeScan, commissioned by the FLO, showed a significant increase in sales of FLO labelled goods which flows against the current economic tide, financial crisis. As in 2007 worldwide sales of Fairtrade certified products were €2.3 billion, representing a 47% annual increase.⁴⁶ And the recent survey shows an increase of sales between 10%, being the lowest in the US, up to 75%, being the highest in Sweden. With furthermore an increase in awareness amongst the 14.500 people questioned throughout the 15 countries. And these figures only amount for the FLO labelled goods, as a continues increase of labels on sustainability are being created, meaning an even higher sales amount on sustainable goods might well be the case, for consumers might change producer but still choose sustainable.⁴⁷

⁴⁶http://www.fairtrade.net/uploads/media/Press_Release_Fair_Trade_EC_Communication_5_May_2009.pdf

⁴⁷[http://www.fairtrade.net/single_view1.html?&cHash=e1af2f62f7&tx_ttnews\[backPid\]=614&tx_ttnews\[tt_news\]=102](http://www.fairtrade.net/single_view1.html?&cHash=e1af2f62f7&tx_ttnews[backPid]=614&tx_ttnews[tt_news]=102)

11. PESTEL Analysis

11.1 Introduction

Having looked at the general concept of Eco-fashion the report will now be continued by analyzing the external environment and seeing what it is that influences Eco-fashion. This being done through a PESTEL analysis which looks at the Political, Economical, Socio-cultural, Technical, Environmental, and Legal factors.

11.2 Political Factors

A recent communication from the Commission of the European Community stipulates that fair-trade is an essentially voluntary private sector phenomenon and that too heavy regulation from the EU can be damaging.⁴⁸ For it feels it should not interfere with private sector initiatives in relation to standardization and labelling of sustainable practises and their sustainable development standards, as it would lead to the limitation of initiatives and their possibility to further develop fair-trade and its standards.⁴⁹

Nonetheless, the Commission feels it can support fair-trade by providing advice on a couple of standards for best practise on the following aspects:

- To achieve greater definitional clarity of the concept, in the form of the publication of a fair-trade charter.
- Applying standards and criteria in a transparent manner, for consumers to be able to make their decision in a well informed manner. With especially focussing upon the extra percentage of pricing being paid to the producers.

⁴⁸ Commission of the European Community (2009), "Contributing to Sustainable Development: The role of Fair Trade and nongovernmental trade-related sustainability assurance schemes", Brussels, Belgium

⁴⁹ Commission of the European Community (2009), "Contributing to Sustainable Development: The role of Fair Trade and nongovernmental trade-related sustainability assurance schemes", Brussels, Belgium

- Control of such standards should be stimulated through increased evaluation processes of NGOs.

As through this advice from the commission the commission aims at a greater collaboration between private projects and the European Economic and Social Committee for establishing basic process requirements, without a direct involvement of the commission leading to a possible limitation of NGOs. However, financing and collaborations with NGOs have been established upon the level of creation of awareness of the concept.⁵⁰

The World Trade Organization (WTO) supports these findings, and would like to ensure transparent and non-discriminatory functioning of the NGOs. Furthermore, focus upon liberalisation of the market for the stimulation of free trade, enabling for the increase of sustainable development.⁵¹ Recognising rules and regulations might lead to restrictions of global trade in which NGOs are limited in their ability to achieve their goal of sustainable development. Aspects related to the liberalisation of the market are discussed bellow, relating to the US farm bill.

Cotton plays an important role within politics, as the cultivation of cotton plays an important role for many governments' economies and therefore they often, if possible, subsidise their farmers to increase their competitive advantage in the world cotton market. Industrialized markets such as those within the EU, US and China are those whom provide subsidies to their farmers. Decreasing the possibility for farmers in third world countries to compete upon the world market. Leading to negative economical effects as global prices are kept artificially low, decreasing the income of a third world country farmer and his chance of survival. This also leads to pushing these farmers in utilizing environmentally harmful methods as production has to be increased and intensified.

⁵⁰ Commission of the European Community (2009), "Contributing to Sustainable Development: The role of Fair Trade and nongovernmental trade-related sustainability assurance schemes", Brussels, Belgium

⁵¹ Commission of the European Community (2009), "Contributing to Sustainable Development: The role of Fair Trade and nongovernmental trade-related sustainability assurance schemes", Brussels, Belgium

Which as a result has those farmers utilize heavy chemicals, expand their land usage and make use of genetically modified cotton varieties. For those involved, decreasing their chance of a sustainable future and affecting future prospects, this in relation to both the environmental as the economical environment.⁵² The figure hereafter illustrates how subsidies are negatively influencing the market, in this specific example the West and Central African (WCA) countries are mentioned.

This has been picked up by the WTO as Brazil was one of the countries whom protested against these types of subsidies being provided by the US. As in 2005 the WTO ruled against the US Farm Bill, which entailed the providing of subsidies and export credit guarantees. Over a period of time, starting from 1999 until 2002, the US paid 12.5 billion dollars to its farmers. Regarding which Brazil states it to be the only reason for the US to have remained second in the world market after China, whom is the first. Brazil is fifth. According to Oxfam the affect of the removal of this subsidy might lead to a global increase of the price of cotton with 6-14%. Benefiting all cotton producing farmers across the world, and more specifically increasing cotton producing WCA countries' incomes with 2.3-5.7%.⁵³

⁵² Ziogiannis N. P.(May 2008), "Cotton subsidies and non-sustainable production in West and Central Africa", Amherst, US, University of Massachusetts

⁵³ <http://www.irinnews.org/Report.aspx?ReportId=74810>

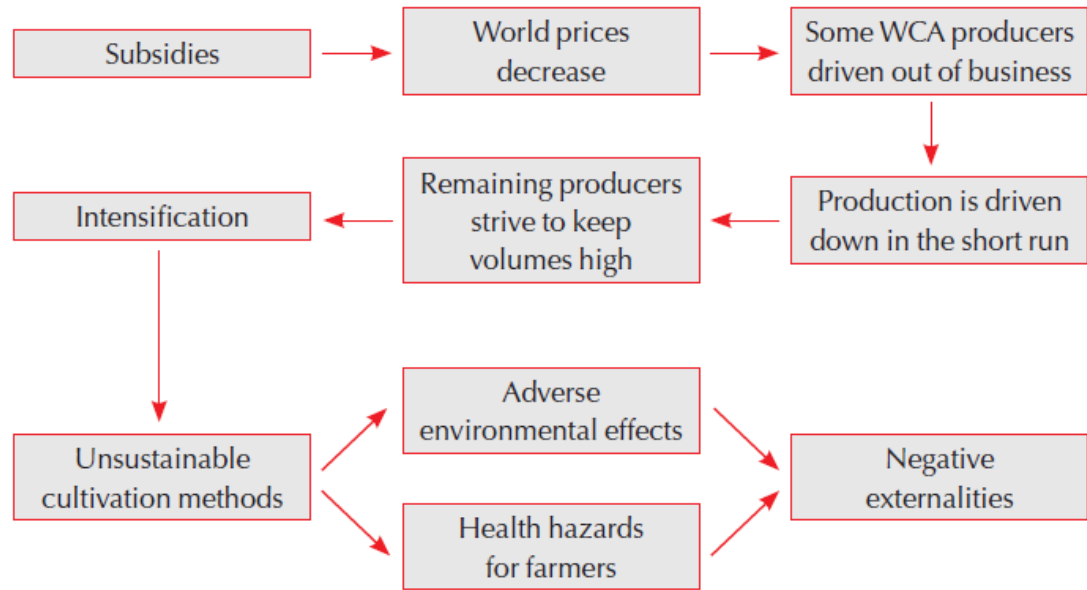


Figure 7 Effects of cotton subsidies on West and Central Africa⁵⁴

Direct political influence further along the apparel supply chain is recognised in the existence of limitations and restrictions of chemical and synthetic dyes for textiles. As many countries have banned numerous azo dyes, e.g. government of India recently banning 74 azo dyes.⁵⁵ Nonetheless, the textile industry is free to utilize still many of the thousands of chemicals for the dyeing process of the fabric.

⁵⁴ Ziogiannis N. P.(May 2008), "Cotton subsidies and non-sustainable production in West and Central Africa", Amherst, US, University of Massachusetts

⁵⁵ Chakraborty L., Chakraborty S., "Application of Eco-Friendly Vegetable Dyes on Cotton Fabric"

11.3 Economical Factors

Looking upon the economical environment within the apparel industry the main focus lies within the cultivation of the raw material, cotton, and how this is currently influenced within the economical environment. As was earlier recognized in the political environment, it is first of all the western economical influence making it difficult for a third world farmer to survive. But what other economical factors play a role within the market place?

One of the farmer's major dilemmas lies in the fact that in the first 4 years, conversion phase, the cultivation of organic cotton does not yield a healthy profit. The first year just a 50% harvest in comparison to conventional cotton is achieved. Therefore making one's decision to shift more difficult, especially in times of recession. Nonetheless, the same research, by the Canadian University of Moncton, states that even with a short term downfall the long term advantages for health, environment, finance as well as the increase in employment and soil management show a great level of return on investment. After a period of 4 years, a higher yield in Kg/ha in combination with a higher price US\$/kg leads to an increase in the gross margin, proving its economical sustainability.⁵⁶

The research furthermore illustrated possible profit and loss statements in relation to 6 different scenarios for conventional and organic cotton farmers in Mali, illustrating the influence of economical factors upon a farmer's gross margin.(see figure 8)

⁵⁶ <http://www.irinnews.org/Report.aspx?ReportId=82947>

I: represents a conventional farmer following the advice of the local agricultural extension agent in relation to the utilization of the recommended amount of fertilisers and insecticides.

II: represents farmers utilizing half of the recommended amount of fertilisers and insecticides, which is often the case for farmers can not afford to utilize the recommended amount.

III: represents farmers in their initial conversion years to organic cultivation.

IV: represents a yield in between the current average of the organic and conventional farmers.

V: represents an equal yield between conventional and organic farmers.

VI: representing an equal gross margin between conventional and organic cotton farmers.

<i>Scenario</i>	<i>Conventional</i>		<i>Organic</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>V</i>	<i>VI</i>
<i>Yield (kg/ha)</i>	1,125	788	570	788	1,125	637
<i>Price (US\$/kg)</i>	0.36	0.36	0.50	0.50	0.50	0.50
<i>Revenue in US\$/ha</i>	410	287	285	394	563	318.5
<i>Production cost</i>						
<i>Chemicals US\$/ha</i>	109.70	58.85	–	–	–	–
<i>Labour hired US\$/ha</i>	2.42	7.27	21.82	21.82	29.00	21.82
<i>Family labour, US\$/ha</i>	25.54	25.54	25.54	25.54	25.54	25.54
<i>Amortisation/ha</i>	50.00	50.00	50.00	50.00	50.00	50.00
<i>Total costs (US\$/ha)</i>	187.66	141.66	97.36	97.36	104.54	97.36
<i>Gross margin (US\$/ha)</i>	222.34	145.34	187.64	296.64	458.46	221.14

Figure 8 Gross margins of conventional and organic cotton farmers in Mali 2004⁵⁷

Illustrating that in order for organic farmers to obtain a similar level of gross margin as that of their conventional competition, they only require an average increase in their yield of 11.7%. A realistic target seeing as the farmers were still in the first years of their conversion phase during research, as later in 2006 was shown that 121 of the organic cotton farmers had reached a yield between 1,000 and 1,5000 Kg/Ha.⁵⁸

⁵⁷ Lakhali, S.Y., Sidibé, H., H'Mida, S. (2008), "Comparing conventional and certified organic cotton supply chains: the case of Mali", *Int. J. Agricultural Resources, Governance and Ecology*, Vol. 7, No. 3, pp.243–255

⁵⁸ Lakhali, S.Y., Sidibé, H., H'Mida, S. (2008), "Comparing conventional and certified organic cotton supply chains: the case of Mali", *Int. J. Agricultural Resources, Governance and Ecology*, Vol. 7, No. 3, pp.243–255

A clear increase has been seen in relation to the popularity of cultivation of organic cotton, according to the Organic Exchange's Organic Cotton Farm and Fibre Report 2008, the amount of organic cotton farmers worldwide grew with 152% between 2007/2008.⁵⁹

Although it has been stated that the recession has led to a decrease in demand for organic cotton. As for instance Helvetas, a Swiss NGO initiating organic cotton cultivation projects within the WCA region, stating that it won't be accepting any new farmers wanting to join the programme as it is not sure it will even be able to sell all of the year's production.⁶⁰ They would rather wait for the impact of the recession to become clear before they are willing to increase current production processes. Although none of the current orders have been cancelled the orders have levelled, with no increase in relation to the previous year.

This is also recognised by OE's senior director, LeRhea Pepper, "*Farmers who planted on speculation or expanded without market partners may have shifted the market into a state of oversupply in 2009*".⁶¹ Recognizing that in order to obtain economical sustainability farmers are to collaborate with business partners, and whether these are NGOs or commercial organizations does not matter, but clearly being a pull oriented market in which farmers are directly reliant upon demand. Speculation might otherwise work counter effective, leading to a decrease of the minimum price of organic cotton, in which the level of economic sustainability is decreased.

Nonetheless, demand for fair-trade labelled commerce is still growing. A recent report resulting from a survey by GlobeScan, commissioned by the Fairtrade Labelling Organization International (FLO), shows an increase in fair-trade sales, trust, and support from consumers flowing against the current economic tide. As the survey, conducted in 15 countries with a sample size of 14.500, shows a sales increase of fair-trade across the globe. In which the consumer finds it as part of a company's Corporate Social Responsibility (CSR) to not only do no harm, but actively support local

⁵⁹ http://www.organicexchange.org/Documents/press_08market.pdf

⁶⁰ <http://www.irinnews.org/Report.aspx?ReportId=82947>

⁶¹ http://www.organicexchange.org/Documents/press_08market.pdf

communities in developing countries.⁶² Showing a continuous potential for fair-trade, inclusive Eco-fashion, making it clear the economical environment does not influence a consumer's perception upon sustainability.

⁶²[http://www.fairtrade.net/single_view1.html?&cHash=e1af2f62f7&tx_ttnews\[backPid\]=614&tx_ttnews\[tt_news\]=102](http://www.fairtrade.net/single_view1.html?&cHash=e1af2f62f7&tx_ttnews[backPid]=614&tx_ttnews[tt_news]=102)

11.4 Socio-cultural Factors

In relation to socio-cultural factors influencing the market environment what can be recognised is that it is the consumer which changes its frame of mind in relation to their purchasing behaviour, becoming aware of what they purchase. Awareness and association of the consumer, relating their need of a product to all that has attributed towards the construction of the final product. The GlobeScan FLO survey enforcing this culture change, as active ethical consumers represent 55% of the population of the 15 countries involved within the survey.⁶³ This furthermore showed major increase in sales of fair-trade labelled products.⁶⁴ Also illustrated in the sales increase over the previous years, with a €2.3 billion sales in 2007, representing a 47% increase from 2006.⁶⁵

This sales increase is also recognised by Wal-Mart (US) and C&A (Belgium), whom represent the two biggest purchasers of organic cotton in the world.⁶⁶ Wal-Mart initiated their sustainable program in 2004, as they set-up a collaboration with Organic Exchange. This was after they had sold 190.000 pieces of organic cotton clothing within a time period of 10 weeks. By coincidence they found consumers were very much interested in buying Eco-fashion products as long as they were affordable.⁶⁷ C&A, a European retailer, purchases 17% of the world's organic cotton with sales of 15 million Eco-fashion pieces in 2008.⁶⁸ Reinforcing that the socio-cultural focus from consumers as well as businesses have shifted, furthermore illustrating the commercial ability of the Eco-fashion concept.

⁶³[http://www.fairtrade.net/single_view1.html?&cHash=e1af2f62f7&tx_ttnews\[backPid\]=614&tx_ttnews\[tt_news\]=102](http://www.fairtrade.net/single_view1.html?&cHash=e1af2f62f7&tx_ttnews[backPid]=614&tx_ttnews[tt_news]=102)

⁶⁴ See 11.3 Economical Factors

⁶⁵[http://www.fairtrade.net/single_view1.html?&cHash=fa0a6ba6fa&tx_ttnews\[backPid\]=614&tx_ttnews\[pointer\]=3&tx_ttnews\[tt_news\]=41](http://www.fairtrade.net/single_view1.html?&cHash=fa0a6ba6fa&tx_ttnews[backPid]=614&tx_ttnews[pointer]=3&tx_ttnews[tt_news]=41)

⁶⁶ http://www.organicexchange.org/Documents/press_08market.pdf

⁶⁷ http://money.cnn.com/2006/07/25/news/companies/pluggedin_gunther_cotton.fortune/index.htm

⁶⁸ C&A Europe (19-05-2009), "Wij willen verantwoord ondernemen", Dutch Metro, Maatschappelijk Verantwoord Ondernemen supplement, p3

11.5 Technological Factors

The technological influence upon Eco-fashion comes from innovation, innovation leading to change in the implementation of sustainability relating to the environment. As constant research is to be conducted in relation to eco alternatives to conventional cultivation of cotton as well as alternatives to textile production leading to the reduction of the environmental footprint.

One such innovation can be recognised in BT cotton, a genetically modified (GM) cotton seed containing *Bacillus thuringiensis*. This is a bacteria that produces a toxin within the plant that works against the Tobacco budworm and Pink bollworm, which are the two biggest insecticidal threats for the cotton cultivation. Newer versions of this BT cotton are being put on the market, which include additional toxins that increase the range of caterpillars it has affect upon.⁶⁹

This GM cotton however is not to be utilized within organic cultivation. The BT cotton is to provide an alternative for conventional cotton, with the aim of decreasing the need for insecticides. Unfortunately the insects become resistant for the BT cotton over time, creating the need for the GM seed to continuously evolve alongside the evolving insects. Furthermore, effectiveness of the BT cotton seed in comparison to organic cultivation has yet to be proven, with research proving the opposite outcome.⁷⁰

In relation to innovations further along the supply chain, herb Infused textiles is an alternative for chemically dyed textiles. Within the concept of herb infused textiles a organic cotton is dyed through the use of medicinal herbs and plants, providing a fully environmentally friendly solution with no chemicals being used at all.⁷¹

⁶⁹ http://cipm.ncsu.edu/cipmpubs/marra_cotton07.pdf

⁷⁰ See 7.3 Environmental Sustainability

⁷¹ <http://www.organicherbinfused.com/Dyeing%20process.html>

One of the main leaders in the area of environmentally friendly dyeing is India. With natural dyes being derived from; plants, India has a broad variety of flora with over 550 plants that are useful for the dyeing process; animals, through utilizing the secretions of insects; minerals, used as bases for the creation of shadings or as supplements in the dyeing process.⁷²

With continuous research being conducted for the improvement of these processes, for the unfortunate turn back of the utilization of natural dyes is the low level of colour fastness in relation to washing, sun light, and rubbing. This fastness being different for each colour of natural dye.(see Figure 9)

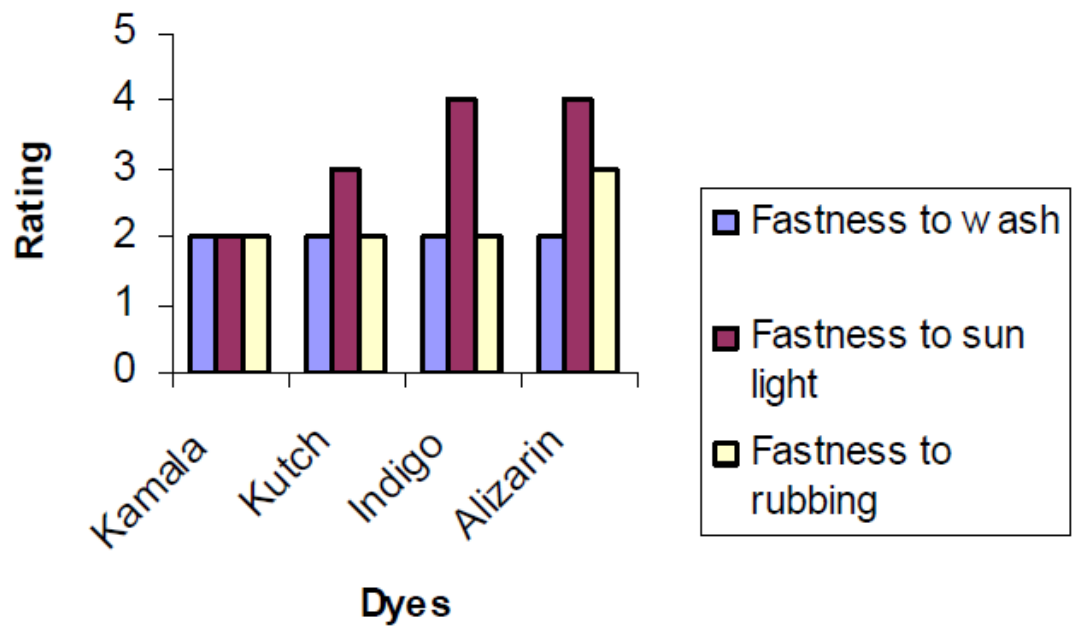


Figure 9 Fastness properties of different dyes⁷³

⁷² Chakraborty L., Chakraborty S., "Application of Eco-Friendly Vegetable Dyes on Cotton Fabric"

⁷³ Chakraborty L., Chakraborty S., "Application of Eco-Friendly Vegetable Dyes on Cotton Fabric"

11.6 Environmental Factors

With the environment's importance at the core of Eco-fashion it is important to analyze the importance of this initiative and why change has to occur. What influences does the apparel industry have upon the environment?

The first stage in the process of the apparel supply chain is the cultivation of the raw material, in this case conventional or organic cotton. It is important to analyse its ecological footprint. (See figure 10)

The land footprint looks at the amount of farm land needed for growing a certain amount of cotton. As illustrated in the figure below it shows that organic cotton, called BASIC cotton by the Sustainable Cotton Project (SCP), utilized less acres of land for the cultivation of a set amount. Taking into account that it is over time that through slow growing processes without the utilization of pesticides and fertilizers organic cotton cultivation provides a stronger fibre with a higher yield of Kg/ha from the cotton cultivation.⁷⁴

The Water footprint focuses upon the amount of water being utilized for the cultivation of cotton. It is a given fact that cotton is a thirsty crop and requires much irrigation. The same concept applies to organic cultivation of cotton, as no sustainable substitute is provided for elimination of this requirement. Nonetheless through the utilization of organic cultivation the process requires a lower amount of water. This is made possible for organic cultivation does not utilize chemical pesticides or insecticides, therefore no irrigation has to take place for the weakening of the

⁷⁴ http://www.sustainablecotton.org/footprint_calculator/growers/

chemicals to a save level.⁷⁵ With additionally having organic cultivation lead to a better water retention, due to an increase of organic matter within the soil.⁷⁶

The Carbon footprint looks upon the area needed to sequester carbon emissions that are involved in the cultivation process. In other words, this links all emissions and how much acres of land are needed to compensate for the emissions being made during the cultivation. Emissions that relate to the planting, maintaining, irrigating, chemical production, disposal, and finally the harvesting of the organic cotton.⁷⁷ The cultivation of organic cotton does in this aspect provide the biggest difference in relation to conventional cultivation. As less irrigation is needed, no chemical products are used, therefore also the emissions involved in the production process of chemicals are deleted, furthermore leading to reduction of the farmer’s disposal. And the harvesting of organic cotton is done by hand and not mechanically also dramatically decreasing the carbon footprint.

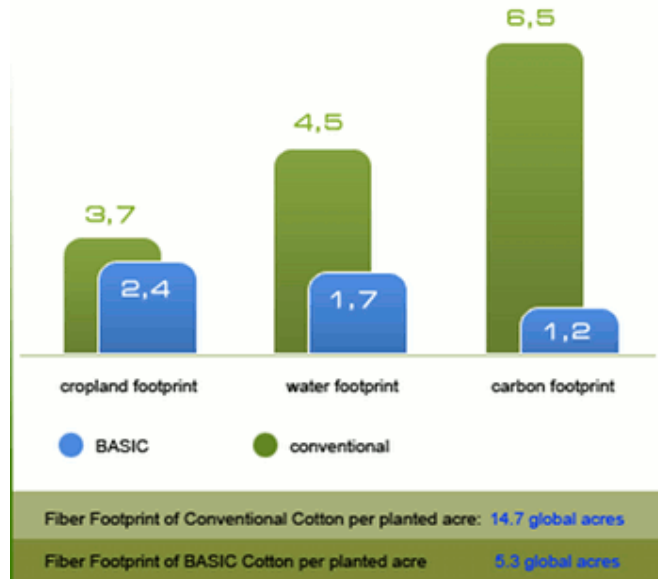


Figure 10 Cotton carbon footprint⁷⁸

⁷⁵ http://www.sustainablecotton.org/footprint_calculator/growers/

⁷⁶ Appendix I - Organic Cotton Cultivation

⁷⁷ http://www.sustainablecotton.org/footprint_calculator/growers/

⁷⁸ http://www.sustainablecotton.org/footprint_calculator/growers/

From cultivation of the raw material the next step is realized in the processing of the fibre in creating the textile. In which multiple treatments are necessary for the fibre to become just that specific fabric a manufacturer requires for its garment.⁷⁹ This aspect within the apparel supply chain, the manufacturing of the fabric, is one that is also harmful to the environment. Eco-friendly alternatives exist, although the need for further R&D is key.⁸⁰

It is stated that the disposable culture of Fast-fashion has a four times higher impact upon the environment. As with the Fast-fashion culture people obtain a habit of disposing their clothes in a four times higher rate than they would when purchasing a more expensive higher quality product. Meaning they utilize four times as much raw materials, water and chemicals as when purchasing a quality product.⁸¹

⁷⁹ See 10.3 Environmental Sustainability

⁸⁰ See 11.5 Technological

⁸¹ http://www.ecotextile.com/news_details.php?id=944

11.7 Legal Factors

In relation to legal requirements within the market place not many laws and regulations exist for the differentiation of the Eco-fashion concept to that of the conventional apparel industry. Nonetheless, some aspects such as certification being provided by NGOs do provide a certain legal framework for the establishing of the concept of Eco-Fashion.

One of such certification is that being provided by the American organization Organic Exchange and the Dutch alternative Made-BY. As these provide a certification for sustainable fashion, to be obtained by a brand only when a contract has been established and they obey the rules of the game. These would be controlled by the NGO and/or monitored by a score card as implemented by Made-By. Showing the consumer up till which level and how in-depth the concept of sustainability is being integrated throughout the brand's supply chain.⁸²⁸³

Another such standard is provided on the level of working conditions by Social Accountability International and their Social Accountability 8000 standard (SA8000). And its Chinese equivalent The China Social Compliance 9000 (CSC9000T).⁸⁴

⁸² http://www.organicexchange.org/standards_a.php

⁸³ <http://www.made-by.nl/bedrijven.php?lg=en>

⁸⁴ See 7.4 Social Sustainability

12. Can Eco-fashion compete with the disposable culture of Fast-fashion?

12.1 Introduction

In order to establish the commercial capability of the concept of Eco-fashion it is important to look at the forces within the industry, determining what the competitive industry environment consists of. Forces influencing Eco-fashion's industry, will be analysed through Porter's Five Forces Model. A model which seeks to establish the attractiveness of a market through analyzing the bargaining power of the suppliers, buyers, new entrants, threat of substitutes, and the extent of competitive rivalry.⁸⁵

12.2 Five Forces Model

12.2.1 The bargaining power of suppliers

When it comes to the suppliers of the Eco-fashion industry, e.g. organic cotton farmers, it is not as much the supplier whom possesses bargaining power. Even though Porter states in relation to the Five Forces model that if suppliers of the raw material are few, and changing to another suppliers is difficult, the supplier might obtain power.⁸⁶ But due to the concept of Eco-fashion, which aims at achieving economic sustainability, for all involved within the supply chain, the buyers of organic cotton pay a set minimum price for the fibre, mainly set by NGOs, with furthermore a additional premium being paid for the product as part of social sustainability for communal purposes.

⁸⁵ Porter M. E. (1980), "Competitive strategy: Techniques for Analyzing Industries and Competitors", The Free Press, New York, US

⁸⁶ Lynch R.(2009), "Strategic Management", 5th Edition, Essex, England, Prentice Hall

Additionally, as has been discussed in relation to the cultivation of organic cotton and its demand and supply, it has been established that 2009 might have the first occurrence of a output surplus of the organic fibre.⁸⁷⁸⁸ Which has lead to farmers having difficulties to sell their organic cotton, creating a counter effective outcome in which no longer economical sustainability can be achieved by the farmers, for the raw material is to be sold on the market for a lower price than its minimum. This is furthermore fuelled by countries that pay subsidies and export credit guarantees.⁸⁹ Therefore disrupting the concept of Eco-fashion.

The market of conventional cotton consists of spot market transactions, a commodity market which trades for cash and provides immediate delivery, and trade on the commodity exchanges around the world. This being done anonymously and all reliant upon fluctuating world cotton prices.⁹⁰ Taking away all bargaining power from the supplier, due to the sheer volume of total suppliers world wide.

Illustrating a great contrast with the organic cotton market, which mostly establishes relationships between buyer and seller for the long term. Unfortunately output surplus might lead to a similar future for the organic market. While currently suppliers are reliant on the NGO set prices and demand, but when supply exceeds demand no guarantees for economical sustainability can be made. Through which vulnerability of the market is emphasised, for when no market pull exists organic cotton value decreases.

⁸⁷ http://www.organicexchange.org/Documents/press_08market.pdf

⁸⁸ See 11.3 Economical Factors

⁸⁹ <http://www.irinnews.org/Report.aspx?ReportId=74810>

⁹⁰ Lakhali, S.Y., Sidibé, H., H'Mida, S. (2008), "Comparing conventional and certified organic cotton supply chains: the case of Mali", *Int. J. Agricultural Resources, Governance and Ecology*, Vol. 7, No. 3, pp.243–255

12.2.2 The bargaining power of buyers

When looking at buyers from a perspective as being the manufacturers of garments within the supply-chain (B2B), one can recognise their bargaining power has recently increased. This has been caused due to the increase of supply of the raw material, in which the buyer has become more important for the supplier, leading to the supplier having to alter its pricing due to the surplus in output of the organic fibre.

Looking at buyers of the final product and their bargaining power (B2C), it can be recognised that the final consumer has great influence upon the level of success of Eco-fashion, as in this context, linking Eco-fashion to commercialization, in which the aim is achieving profit/surplus competing with the conventional apparel industry, for when people are not interested in the concept they won't end up buying the products. Either the consumer is motivated to buy for it is sustainable, motivated to buy for the design, or motivated by pricing. Similarly being attracted through a company's SCA of either focus, differentiation, or cost leadership.

Looking at the implementation of Eco-fashion by major retailers, e.g. Wal-Mart and C&A, it can be recognised that the apparel products both conventional and Eco-fashion are sold alongside one another. But as the product of Eco-fashion is very much differentiated it provides a strong competitive advantage. Especially as such major retailers are able to deliver the final product at a similar price level as its conventional competitor due to the ability of creating Economies of Scale.

12.2.3 The threat of possible new entrants

As the concept of Eco-fashion provides many aspects throughout the supply-chain to be implemented before achieving the preferred implementation of the concept, it can be recognised as an industry with a high barrier for new entrants, therefore a low threat of new entrants. This being unfortunate, for the concept provides sustainable development with many NGOs seeking for new entrants. Therefore the existence of these NGOs, e.g. Organic Exchange and Made-By, in

order to stimulate organizations to shift to Eco-fashion. Providing much help in the adaptation/conversion process of the apparel supply chain.^{91,92}

A recent articles stated that Louis Vuitton Moët Hennessy (LVMH), a luxury goods corporation, will be purchasing a major share in Edun, one of the fist Eco-fashion brands establishes by Ali Hewson (wife of Bono, lead singer of U2), showing the willingness of luxury brands to enter into a sustainable fashion future.⁹³

12.2.4 The threat of substitutes

The substitution of the concept of Eco-fashion is a unlikely one, due to the sheer requirements on the level of sustainable development. Nonetheless, the competitiveness of the apparel industry might be one that could lead to the non-switching of consumers due to possible cost differences, between conventional and/or Fast-fashion and Eco-fashion. For the Eco-fashion industry is to compete upon the same level as in which Fast-fashion might be supplied to the final consumer. Providing the ability for consumers to easily switch and substitute their preferred goods.

12.2.5 The extent of competitive rivalry

As within the current apparel industry, like most other industries, SCA is achieved through either cost-leadership, differentiation, or focus.⁹⁴ The question being whether Eco-fashion is able to compete with the conventional apparel industry, and if so through which sources of competitive advantage?

⁹¹ <http://www.organicexchange.org/mission.php>

⁹² <http://www.made-by.nl/bedrijven.php?lg=en>

⁹³ http://www.ecotextilenews.com/news_details.php?id=963

⁹⁴ Porter M. (1985) "Competitive advantage: Creating and sustaining superior performance" New York, New York: Macmillan

Eco-fashion can be recognised as having three main competitive advantages through the implementation of the three pillars of sustainable development. A recent study comparing the supply chain of conventional and organic cotton emphasises that in order to link sustainability to a competitive advantage the organising of the value chain, cost reduction, and implementing the green issues in the marketing strategy are key success factors.⁹⁵ To be achieved through the implementation of a holistic branding strategy.

The basis of this strategy is to be found within certification of corporations by NGOs. Certification functioning as a prove of a manufacturer's claim in relation to sustainability, providing a source of competitive advantage in comparison to its uncertified competitor.⁹⁶ A marketing tool illustrating the value adding process, to be recognised in a track-and-trace system, providing the ability for the final consumer to track one's product all the way back to the farmer of the raw material.⁹⁷

Corporations that collaborate with NGOs obtain continuous information from the NGO in relation to best practise and advice on implementation of sustainability throughout one's supply chain. Therefore providing another source for competitive advantage through knowledge management and consultation.⁹⁸

When comparing competitiveness in cost leadership between Eco-fashion and conventional it can be recognised that on average it is only a 2% price difference for the final consumer, when a producer chooses to utilize organic cotton. For the costs of cotton represent 4% of production costs, therefore taking in consideration a 2.0 profit margin for the retailer leading to a representation of 2% for the cotton costs for the final consumer.(see figure 11)

⁹⁵ Lakhal, S.Y., Sidibé, H., H'Mida, S. (2008), "Comparing conventional and certified organic cotton supply chains: the case of Mali", *Int. J. Agricultural Resources, Governance and Ecology*, Vol. 7, No. 3, pp.243–255

⁹⁶ http://www.bluesign.com/fileadmin/downloads/Systembrochure_E.pdf

⁹⁷ <http://www.made-by.nl/tracktrace.php?lg=en>

⁹⁸ http://www.organicexchange.org/Documents/farm_baseline.pdf

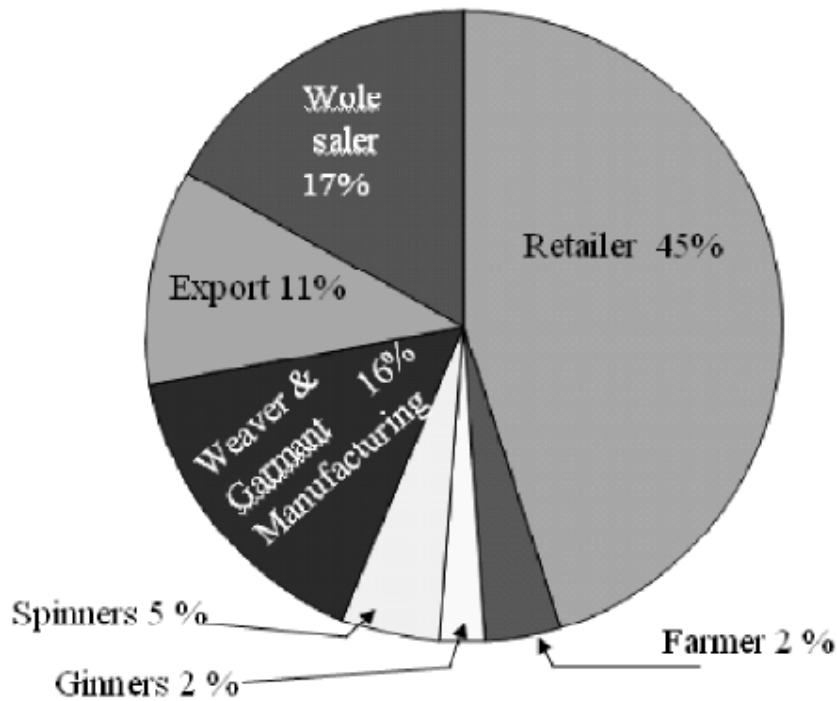


Figure 11 Distribution of the t-shirt price through the cotton supply chain⁹⁹

The market is segmented by different price ranges, varying from expensive luxury brands to cheaper retailers such as Wal-Mart. The concept of Eco-fashion is represented throughout all segments, competing within different levels. Nonetheless, pricing might well be linked to the success of commercialization. Meaning Eco-fashion might be introduced throughout several concepts with several pricing ranges, but the actual success of the concept being introduced might be set to whether or not people are willing to pay extra. Sustainability won't immediately motivate a consumer's purchase, but when a purchase is made and it's a sustainable product it is an extra.

In the mean time it can be recognised that a C&A is able to obtain SCA through multiple factors, which can be seen as bringing a niche market into a larger commercialised environment, as it

⁹⁹ Lakhal, S.Y., Sidibé, H., H'Mida, S. (2008), "Comparing conventional and certified organic cotton supply chains: the case of Mali", *Int. J. Agricultural Resources, Governance and Ecology*, Vol. 7, No. 3, pp.243-255

achieves cost leadership through economies of scale, therefore eliminating the additional cost that are connected to organic cotton. And differentiation through the ability to provide Eco-fashion at affordable prices.¹⁰⁰.

¹⁰⁰ C&A Europe (19-05-2009), "Wij willen verantwoord ondernemen", Dutch Metro, Maatschappelijk Verantwoord Ondernemen supplement, p3

13. How can the Eco-fashion industry best utilize external forces to its advantage?

13.1 Introduction

As it has become clear that a high involvement from multiple NGOs is established in relation to the concept of Eco-fashion, it is now important to distinguish to what level this involvement and co-operation leads to beneficial outcome for the Eco-fashion concept. Within the Four Link Model all types of co-operations and networks involved with the Eco-fashion industry are focussed upon. Looking at government links and networks, formal co-operative links, informal co-operative links and networks, and complementors.

13.2 Four Link Model

13.2.1 Government links & networks

The government links & networks can be recognised in the Commission of the European Community, stipulating the stimulation of the creation of awareness of the concept of sustainability. Where furthermore the emphasise lay in the consultation and on standardization of the concept for all NGOs, for the EU feels it should not limit possibilities for further development and implementation by NGOs.¹⁰¹

13.2.2 Formal co-operative linkages

Formal co-operative linkages within Eco-fashion are establishment through certification, which vary upon focus of environmental, social, and economical standards. Organic Exchange, Made-By,

¹⁰¹ See 11.2 Political

Helvetas, and FLO are only some examples of such NGOs that have previously been discussed throughout this report.

Advantages of the established formal linkages can be seen on the level of consultation, knowledge management, certification etc. A situation in which the commercial organizations linked to these NGOs would obtain a competitive advantage within the market, for not only information provides a basis for success as the eventual certification does also provide a tangible prove, for the final consumer, of the corporation's intent.

13.2.3 Informal co-operative links and networks

Informal co-operative linkages are established upon a similar level and by the similar organizations as stated above. With the mean difference that formal co-operative linkages are often fixed through a contractual agreement, and informal links do not involve contracts.

In this case seminars are one of the main sources for informal links to be established. With one such being annually organised by Organic Exchange and Made-by, focussing upon best practise of the implementation of the concept of sustainability throughout an apparel corporation's supply chain.¹⁰²

Additionally, in light of the cultivation and production of natural fibres the United Nations (UN) in association with the Food and Agriculture Organization of the United Nations (FAO) have initiated the International Year of Natural Fibres (IYNF) for the year 2009. This year promotes the efficiency and sustainability of the natural fibre industry throughout the world.¹⁰³ Providing a major platform for promotion of the Eco-fashion concept.

¹⁰² http://www.made-by.nl/bedrijven_seminar.php?lg=en

¹⁰³ <http://www.naturalfibres2009.org/en/iynf/index.html>

13.2.4 Complementors

Complementors consist of products that complete one another, leading to the increase in value of the combined product. Relating this concept to the concept of Eco-fashion it can be recognised that Eco-fashion provides itself with complementors through the implementation of sustainable development. In which throughout the supply chain value is added to the product, leading to a differentiated product being delivered to the market.

14. Conclusion and Recommendations

With the concept of Eco-fashion implementing sustainability on three levels, environmental, social, and economical, much has to be changed within a conventional supply chain of the apparel industry to achieve full implementation of this concept. The main question arising whether the implementation of such practises can still lead to a successful commercialization of Eco-fashion?

With environmental sustainability focussing upon organic cultivation, which currently represents less than 0.55% of the world's cotton production it seems a lost cause. Nonetheless, in the past year supply of organic cotton increased 152% and demand has increased for consumers have, even in the current recession, continued to be aware of the environmental hazards. Demanding corporations to take responsibility for their actions and furthermore work upon development towards an environmentally sustainable future as part of their CSR.

Co-operation of the apparel industry with organizations such as Organic Exchange, can lead to the establishing of commercial ventures between organic cotton farmers and major retailers. Arriving at the point of economical sustainability, as fair-trade provides an honest commercial future for farmers in poor and developing countries. They are being paid a higher price/Kg for their cotton and an additional premium for communal purposes. Together with potentially higher gross profit margins it seems for an attractive future.

Unfortunately no guarantee can be given to an organic farmer when it starts speculating upon market demand, for through individual ventures farmers are not guaranteed high prices and a premium. For only through the collaboration with NGOs, which establish demand from the commercial market, sale can be assured. Pinpointing that where current demand is not exceeding supply, and farmers come to an output surplus, surplus leads to a counter-effective outcome for market value of organic cotton drops. Leading to a similar situation as that within the

conventional cotton market, where the amount of farmers is so spread and supply is immense, suppliers have no power. And will not be provided with a set pricing, as with fair-trade, where farmers collaborate with NGOs and define price levels.

Social sustainability within the apparel supply chain is not only achieved through the premium being paid on top of the organic cotton prices, but also through the optimization of the working conditions throughout the complete production process. As NGOs market social systems and standardization requirements such as the SA8000 system. Which should be seen as a positive investment in the labour force, leading to increased motivation and productivity.

Comparing conventional and Eco-fashion, the eventual main differences in pricing for the final consumer might be limited, with approximately 2%. But it would be the additional competitive advantage of the Eco-fashion concept that should compensate and motivate a consumer to a purchase. Having the marketing strategy focus upon the sustainable development aspects, which are implemented throughout the Eco-fashion supply chain.

Coming to the conclusion that collaborations between commercial organizations and NGOs are key. In which it is the function of NGOs to establish commerce. Being the link between sustainable development and its implementation within a commercial venture. As for all stakeholders a greater collaboration is beneficial, for without commercial interest no development can take place. And for those wanting to contribute to sustainability, but maintain their commercial focus, NGOs provide a platform for development while being able to exploit a commercial venture.

15. Bibliography

15.1 Literature:

- Brower C., Mallory R., Ohlman Z. (2005), "Experimental Eco >Design; Architecture/Fashion/Product", Mies, Switzerland, RotoVision,
- Lynch R.(2009), "Strategic Management", 5th Edition, Essex, England, Prentice Hall
- Porter M. (1985), "Competitive advantage: Creating and sustaining superior performance", New York, New York, Macmillan
- Porter M. (1980), "Competitive strategy: Techniques for Analyzing Industries and Competitors", The Free Press, New York, US

15.2 Articles:

- "MAGIC Marketplace Drives Eco-Fashion From Harvest to High Street", *Business Wire*, New York, Apr 29,2008
- Adams W.M. (22 May 2006): "The Future of Sustainability: Re-thinking Environment and Development in the Twenty-first Century" Report of the IUCN Renowned Thinkers Meeting
- Ahuja M. (17 Sep 2008), "Great cotton rush", *McClatchy – Tribune Business News*, Washington
- Bass D. D. (17 Sep 2008), "Eco-fashion concerns beyond, "Paper or plastic?"" , *McClathy – Tribune Business News*, Washington

- Belli R. (Sep/Oct 2007), "The Eco-fashion revolution", E - The Environmental Magazine, Vol. 18 Issue 5, p26-31
- Chakraborty L., Chakraborty S., "Application of Eco-Friendly Vegetable Dyes on Cotton Fabric"
- Commission of the European Community (2009), "Contributing to Sustainable Development: The role of Fair Trade and nongovernmental trade-related sustainability assurance schemes", Brussels, Belgium
- European Commission (28-06-2007): "Organic production and labelling of organic products and repealing Regulation (EEC) No 2092/91" Council regulation (EC) No 834/2007
- European Commission (29-08-2008): "amending Regulation (EC) No 834/2007 on organic production and labelling of organic product" Council regulation (EC) No 976/2008
- Fairtrade Labelling Organization International (2007), "Annual Report 2006/2007", Bonn, Germany
- Gershon J. (Jul/Aug 2005), "Wearing your values: Eco-fashion on today's runway", E - The Environmental Magazine, Vol. 16 Issue 4, p56-166
- Lakhal, S.Y., Sidibé, H., H'Mida, S. (2008), "Comparing conventional and certified organic cotton supply chains: the case of Mali", Int. J. Agricultural Resources, Governance and Ecology, Vol. 7, No. 3, pp.243–255
- Made-By (May 2008): " , Made-By goes international" Made-By Annual report 2007: 18

- McCauley LA, Anger WK, Keifer M, Langley R, Robson MG, and Rohlman D (June 2006).
"Studying health outcomes in farmworker populations exposed to pesticides"
Environmental Health Perspectives 114: 953–960
- Price L. (22 Apr 2008), "Wearing with care: Eco-fashion movement encompasses many shades of green", *McClatchy – Tribune Business News*, Washington
- Serageldin I, Steer A (1994): "Valuing the Environment: Proceedings of the First Annual International Conference on Environmentally Sustainable Development" World Bank Report Number 13520: 45
- Smith R. A. (24 May 2008), "Weekend Journal; Style -- Apparel: Shades of Green: Decoding Eco Fashion's Claims", *Wall Street Journal (eastern Edition)*, New York
- Sullivan R. (1 May 2007), "Earth to fashion; We're getting the message: The eco-friendly trend is good for the planet", *Vogue*
- United Nations.(11-12-1987): "Report of the World Commission on Environment and Development" General Assembly Resolution 42/187
- Ziogiannis N. P. (May 2008), "Cotton subsidies and non-sustainable production in West and Central Africa", Amherst, US, University of Massachusetts

15.3 Internet:

- “100% organic cotton – at C&A throughout Europe from 12 March”,
http://www.organicexchange.org/Documents/press_ca.pdf, 14-05-2009
- Apparel Supply Chain and its Variations, <http://www.fibre2fashion.com/industry-article/11/1067/apparel-supply-chain-and-its-variants2.asp>, 12-05-2009
- Bluesign system brochure,
http://www.bluesign.com/fileadmin/downloads/Systembrochure_E.pdf, 12-05-2009
- Burkina Faso: Cotton producers celebrate WTO ruling against US subsidies,
<http://www.irinnews.org/Report.aspx?ReportId=74810>, 19-05-2009
- Cotton subsidies and non-sustainable production in West and Central Africa,
http://helvetas.org/global/pdf/topic/biobaumwolle/08_rural_eng_33-35_07.pdf, 14-05-2009
- “Eco-friendly fashion”, <http://www.stepin.org/casestudy.php?id=ecofashion&page=2>, 14-05-2009
- European Commission Eco-label,
http://ec.europa.eu/environment/ecolabel/product/pg_clothing_textiles_en.htm, 14-05-2009
- European Commission Soil,
http://ec.europa.eu/agriculture/organic/environment/soil_en, 14-05-2009
- European Commission, What is Organic farming,
http://ec.europa.eu/agriculture/organic/organic-farming/what-organic_en, 14-05-2009

- Farm System Crops Baseline Report,
http://www.organicexchange.org/Documents/farm_baseline.pdf, 16-05-2009
- Fairtrade flows against economic tide,
[http://www.fairtrade.net/single_view1.html?&cHash=e1af2f62f7&tx_ttnews\[backPid\]=614&tx_ttnews\[tt_news\]=102](http://www.fairtrade.net/single_view1.html?&cHash=e1af2f62f7&tx_ttnews[backPid]=614&tx_ttnews[tt_news]=102), 14-05-2009
- Fair Trade movement welcomes support by the European Commission to Fair trade,
http://www.fairtrade.net/uploads/media/Press_Release_Fair_Trade_EC_Communication_5_May_2009.pdf, 09-05-2009
- FLO International Introduces Regional Fairtrade Minimum Prices for Cotton,
[http://www.fairtrade.net/single_view1.html?&cHash=a3c7a90d29&tx_ttnews\[backPid\]=614&tx_ttnews\[pointer\]=3&tx_ttnews\[tt_news\]=42](http://www.fairtrade.net/single_view1.html?&cHash=a3c7a90d29&tx_ttnews[backPid]=614&tx_ttnews[pointer]=3&tx_ttnews[tt_news]=42), 16-05-2009
- Fibre Footprint Calculator,
http://www.sustainablecotton.org/footprint_calculator/growers/, 14-05-2009
- General description to CSC9000T,
http://www.csc9000.org.cn/en/AboutCSC9000T_Detail.asp?DID=232, 10-05-2009
- “H&M Continues to go organic”,
<http://www.hm.com/us/press/pressreleases/fashion/fashionpresselease.ahtml?presseleaseid=642&nodeid=334>, 14-05-2009
- Important innovations in the cotton production,
http://cipm.ncsu.edu/cipmpubs/marra_cotton07.pdf, 14-05-2009
- International Year of Natural Fibres About,
<http://www.naturalfibres2009.org/en/iynf/background.html>, 14-05-2009

- International Year of Natural Fibres Why,
<http://www.naturalfibres2009.org/en/iynf/index.html>, 14-05-2009
- LVMH moves on Edun Apparel,
http://www.ecotextilenews.com/news_details.php?id=963, 16-05-2009
- Made-By Environmental impact, <http://www.made-by.nl/infoshow.php?ih=2&is=3&lg=en>, 14-05-2009
- Made-By for Companies, <http://www.made-by.nl/bedrijven.php?lg=en>, 14-05-2009
- Made-By Mission, http://www.made-by.nl/madeby_missie.php?lg=en, 14-05-2009
- Made-By Seminar, http://www.made-by.nl/bedrijven_seminar.php?lg=en, 14-05-2009
- Made-By Track and Trace, <http://www.made-by.nl/tracktrace.php?lg=en>, 14-05-2009
- Natural Pest Control For The Long Term,
<http://www.planetnatural.com/site/xdpy/kb/natural-pest-control.html>, 14-5-2009
- Organic Cotton Beats Bt Cotton in India, <http://www.i-sis.org.uk/OCBBCI.php>, 11-05-2009
- Organic cotton production as a solution for social and ecological issues,
http://helvetas.org/wEnglish/organic_cotton/konsumenten.asp?navid=49, 14-05-2009
- “Organic Cotton Production Grows 152 Percent in 2007/2008, New Organic Exchange Report Shows”, http://www.organicexchange.org/Documents/press_08fiber.pdf, 14-05-2009
- Organic Dyeing Process, <http://www.organicherbinfused.com/Dyeing%20process.html>, 14-05-2009

- Organic Exchange 100 & Organic Exchange Blended Standards,
http://www.organicexchange.org/standards_a.php, 14-05-2009
- Organic Exchange, Mission, Goals and Strategies,
<https://www.organicexchange.org/mission.php>, 14-05-2009
- Organic for everyone, the Wal-Mart way,
http://money.cnn.com/2006/07/25/news/companies/pluggedin_gunther_cotton.fortune/index.htm, 09-05-2009
- Overview of Social Accountability 8000,
<http://www.sa-intl.org/index.cfm?fuseaction=Page.viewPage&pageId=473>, 14-05-2009
- “PANNA: Problems with conventional cotton production”,
<http://www.panna.org/files/conventionalCotton.dv.html>, 14-05-2009
- Research: fast-fashion has four times impact,
http://www.ecotextile.com/news_details.php?id=944, 14-05-2009
- Seeds and Threats, http://www.monsanto.com/products/seeds_traits/cotton.asp, 14-05-2009
- Solidaridad Fair Clothing from China,
<http://www.solidaridad.nl/katoen/eerlijke-kleding-uit-china>, 14-05-2009
- Solidaridad, Made-By, <http://www.solidaridad.nl/merken/made-by>, 14-05-2009
- “Strategic partnership: C&A, Organic Exchange and Shell Foundation seal five-year cooperation”, http://www.organicexchange.org/Documents/PI_Partnership_engl.pdf, 18-10-2008

- Sustainability: Human, Social, Economic and Environmental,
<http://www.wiley.co.uk/egec/pdf/GA811-W.PDF>, 14-05-2009
- United States Department of Agriculture,
<http://www.ams.usda.gov/AMSV1.0/ams.fetchTemplateData.do?template=TemplateA&navID=NationalOrganicProgram&leftNav=NationalOrganicProgram&page=NOPNationalOrganicProgramHome&acct=nop>, 14-05-09
- “What is Fairtrade?”, http://www.fairtrade.net/what_is_fairtrade.html, 14-05-2009
- West Africa: can organic cotton save the industry,
<http://www.irinnews.org/Report.aspx?ReportId=82947>, 14-05-2009

16. Appendices


16.	Appendices	I
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16.2	Appendix II – Check List European Eco-label for Textiles	III

16.1 Appendix I - Organic Cotton Cultivation

ORGANIC COTTON is different

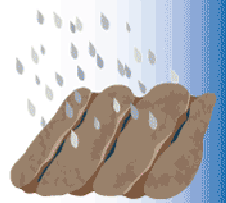
By choosing organically grown cotton, you can reap all the benefits of cotton's beauty, comfort, and strength while minimizing harm to people and the planet.

Seed Preparation

	CONVENTIONAL	ORGANIC
	<ul style="list-style-type: none"> Typically treats seeds with FUNGICIDES or INSECTICIDES. Uses GMO seeds for approximately 70% of US-grown cotton. 	<ul style="list-style-type: none"> Uses UNTREATED seeds. NEVER USES GMO (genetically modified organism) seeds.

Soil & Water

	CONVENTIONAL	ORGANIC
	<ul style="list-style-type: none"> Applies SYNTHETIC fertilizers. Loss of soil due to predominantly MONO-CROP culture. Requires INTENSIVE IRRIGATION. 	<ul style="list-style-type: none"> Builds strong soil through CROP ROTATION. Retains water more efficiently thanks to increased ORGANIC MATTER in the soil.

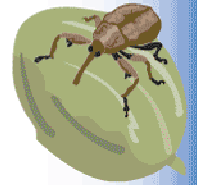


Weed Control

	CONVENTIONAL	ORGANIC
	<ul style="list-style-type: none"> Applies HERBICIDES to soil to inhibit weed germination. Repeatedly uses HERBICIDES to kill weeds that do grow. 	<ul style="list-style-type: none"> PHYSICAL removal rather than chemical destruction. Controls weeds through cultivation and HAND HOEING.

Pest Control

	CONVENTIONAL	ORGANIC
	<ul style="list-style-type: none"> Uses INSECTICIDES heavily, accounting for approximately 25% of world consumption Uses PESTICIDES; the nine most common are highly toxic; five are probable carcinogens. Frequently uses AERIAL SPRAYING, with potential drift onto farm workers, neighboring wildlife and communities. 	<ul style="list-style-type: none"> Maintains a BALANCE between "pests" and their natural predators through healthy soil. Uses BENEFICIAL INSECTS, biological and cultural practices to control pests. May use TRAP CROP, planted to lure insects away from the cotton.



Harvesting

	CONVENTIONAL	ORGANIC
	<ul style="list-style-type: none"> Defoliates with toxic CHEMICALS. 	<ul style="list-style-type: none"> Relies mostly on the seasonal FREEZE for defoliation. May stimulate defoliation through WATER management.

Figure 12 Difference between organic and conventional cotton cultivation¹⁰⁴

¹⁰⁴ <http://www.aboutorganiccotton.org/OCdiff.html>

16.2 Appendix II – Check List European Eco-label for Textiles

Check-list (for a first assessment only)

European Commission



Life Cycle Step	Criterion	Expectations
Manufacturing (fibres)	Type of fibres	<ul style="list-style-type: none"> •• All types of fibres can be used, with the exception of mineral fibres, glass fibres, metal fibres, carbon fibres and other inorganic fibres. •• The criteria for a given-fibre type need not be met if that fibre contributes to less than 5% of the total weight of the textile fibres in the product, or if the fibres are of recycled origin.
Manufacturing (fibres)	Limitation of toxic residues in fibres	<ul style="list-style-type: none"> •• Acrylic: Acrylonitrile < 1.5mg/kg •• Cotton: residues of certain pesticides < 0.05ppm •• Elastane and polyurethane: no organotin compounds •• Greasy wool and other keratin fibres: limitations of certain pesticides •• Man-made cellulose: AOX < 250ppm •• Polyester: Antimony < 260ppm •• Polypropylene: no lead based pigments
Manufacturing (fibres)	Reduction of air pollution during fibre process	<ul style="list-style-type: none"> •• Acrylic: acrylonitrile < 1g/kg •• Elastane and polyurethane: aromatic diisocyanates < 5mg/kg •• Man-made cellulose: S < 120g/kg (filament) and 30g/kg (staple) •• Polyamide: N₂O < 10g/kg polyamide 6 and < 50g/kg polyamide 6.6 •• Polyester: VOCs < 1.2g/kg
Manufacturing (fibres)	Reduction of water pollution during fibre process	<ul style="list-style-type: none"> •• Flax and other bast fibres: COD/TOC from water retting reduced by at least 75% (hemp) and 95% (flax, other) •• Viscose: Zn < 0.3g/kg •• Cupro: Cu < 0.1ppm •• Greasy wool and other keratin fibres: COD < 60 g/kg, 75% reduction of COD, off-site treatment. If on-site treatment, COD < 5 g/kg, 6 < pH < 9 and T < 40 °C
Manufacturing (processes and chemicals)	Limitation of the use of substances harmful for the environment (in particular aquatic environment) and health process	<ul style="list-style-type: none"> •• 90% of carding and spinning oil, lubricants and finishes for primary spinning and 95% of sizing preparations, detergents, fabrics softeners and weight complexing agents shall be sufficiently biodegradable or eliminable. •• Polycyclic aromatic hydrocarbons (PaH) in mineral oils < 1% •• No cerium compounds, halogenated carriers •• No heavy metals and formaldehyde in stripping and depigmentation •• No APEOs, DTDMAC, DSDMAC, DHTDMAC, EDTA, LAS, DTPA, chrome mordant dyeing •• AOX emissions from bleaching agents < 40 mg Cl/kg (100mg in certain cases) •• Level of impurities in dyes (in ppm): Ag < 100 Ba < 100 Co < 500 Se < 20 Fe < 2500 As < 50 Cd < 20 Cr < 100 Cu < 250 Hg < 4 Ni < 200 Pb < 100 Sb < 50 Sn < 250 Zn < 1500 Mn < 1000 •• Level of impurities in pigments (in ppm): As < 50 Cd < 50 Cr < 100 Hg < 25 Pb < 100 Sb < 250 Zn < 1000 Ba < 100 Se < 100 •• No chlorophenols, PCB and organotin compounds during transportation or storage •• No biocidal or biostatic products active during use phase •• Discharge to the water of metal complex dyes based on Cu, Cr or Ni: max 20% (cellulose dyeing), 7% (other dyeing process). After treatment: Cu < 75 mg/kg (fibre, yarn, fabric), Cr < 50 mg/kg, Ni < 75 mg/kg •• No azo dyes that cleave to a list of aromatic amines •• No dyes classified as carcinogenic, mutagenic, toxic for reproduction according to Directive 67/548/EEC. •• No potentially sensitising dyes if fastness to perspiration > 4 •• Printing pastes < 5% VOCs. No plastisol based printing •• Formaldehyde < 30ppm for products in direct contact with the skin. 300ppm for others •• COD from wet-processing < 25g/kg. If on-site treatment, 6 < pH < 9 and T < 40°C •• No flame retardants or finishing substances containing > 0.1% of substances classified as carcinogenic, mutagenic, toxic for reproduction and dangerous for the environment according to Directive 67/548/EEC •• Shrink resistant finishes only allowed for wool slivers •• Coatings, laminates and membranes: no plasticizers or solvents assigned a list of R-phases according to Directive 67/548/EEC
Use	Performance and durability	<p>The following tests shall be carried out either on dyed yarn, final fabrics or final product:</p> <ul style="list-style-type: none"> •• Dimensional changes during washing and drying: 8% for knitted products, 8% for terry towelling, 6% for other woven products, 2% removable and washable curtain and furniture fabric •• Colour fastness to perspiration (acid, alkaline), washing, wet rubbing, dry rubbing, light (see criteria)

Figure 13 Checklist European Eco-label for textiles¹⁰⁵

¹⁰⁵ http://ec.europa.eu/environment/ecolabel/images/pg_clo16.jpg

