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Going Eco, Going Dutch

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Abstract

This paper presents the results of the research project 'Going Eco, Going Dutch' (2015–2017), which investigated the production, design and branding of fashion textiles made from locally produced hemp fibers in the Netherlands. For fashion labels and designers it is often difficult to scrutinize the production of textile fabrics manufactured in non-European countries due to physical distance and, often, non-transparency. At the same time, many designers and established fashion brands increasingly search for sustainable textiles that could be recycled or upcycled after being used by consumers. For the project 'Going Eco, Going Dutch', local textile manufacturers and fashion brands closely collaborated to explore how to develop fashionable textiles made from locally produced hemp – from the very first fiber to the final branding of the fashion product. In addition to the technical insights on the production of hemp, this paper will present and highlight the importance of the visual identity of the textiles, which was created by using Dutch traditional crafts – suggesting that this should be understood in terms of Kristine Harper's 'aesthetic sustainability' (2017) as an essential design strategy. In addition, this paper will reflect on the importance of storytelling by focusing on locality and transparency, and on creating an emotional bond and connection between producer, product and consumer. This paper will argue that this form of 'emotional durability' (Chapman, 2005, 2009) is essential to both design and branding strategies. Moreover, this paper will critically reflect on the performance of Dutchness – Dutch national identity – through these locally produced fibers, textiles and fashion products.

Keywords: locality, transparency, hemp, aesthetic sustainability, performing Dutchness

Introduction

It is a time in which we are collectively exploring how to transition to a circular society with a more responsible and sustainable engagement with our material resources. The world is facing huge environmental issues with a growing population consuming the planet's resources. The way in which the fashion and textile industry currently operates causes many socio-cultural, economic and environmental problems, such as overproduction, overconsumption, waste, poor working conditions, and high demands for designers. There is more and more awareness that our current fashion system is untenable.

The fashion and textile industry increasingly understands that it needs to move towards a circular fashion system with more transparency (see e.g. the report 'Pulse of the Fashion Industry', March 2017). More and more fashion brands and designers incorporate sustainability and the principles of the circular economy into their policies, yet there are still many challenges and unanswered questions regarding materials and production processes, circular design strategies and how to reach consumers. A transparent closed loop economy could potentially be a solution for optimal resource and waste management. Here, the local production of the fibers (reduction of transport) and recycling or upcycling (transforming no or low value material into high value material) will bring environmental benefit and great savings in energy use. As Ellen MacArthur stated when launching their 'Circular Fibres Initiative'.

[t]he way we produce, use, and reprocess clothing today is inherently wasteful, and current rising demand increases the negative impacts. The Circular Fibres Initiative aims to catalyse change across the industry by creating an ambitious, fact-based vision for a new global textiles system, underpinned by circular economy principles, that has economic, environmental, and social benefits, and can operate successfully in the long term (MacArthur, 2017)¹.

Although there is a rapid increase of diverse initiatives related to circular materials and circular fashion, we are still far removed from an integrated, circular fashion system.

This is related to the great physical distance between design and manufacturing. In the West, we live in a post-industrial society focused on creative design and the symbolic and aesthetic value of fashion: 'due to the industry's increasing relocation and outsourcing of manufacturing functions, the site of fashion design has become spatially separated from the site of clothing manufacture' (Köppchen, 2014: 18–19). Due to the great geographical distance between design and production, a lot of knowledge has been lost. As Appadurai has argued, '[a]s commodities travel greater distances (institutional, special, temporal), knowledge about them tends to become partial, contradictory, and differentiated' (1986: 56).

This is also the case in the Netherlands. The Dutch clothing industry started to outsource – and to delocalize – its production in the 1960s (Scheffer, 2017: 57). From the 1980s Dutch companies increasingly engaged in design and (creative) commercialization, and the production was almost entirely subcontracted or delocalized offshore. By the 1990s, clothing production had disappeared almost completely (Ibid.: 57–61). Today, the 'majority of Dutch fashion is designed in the Netherlands, but manufactured abroad' (Köppchen, 2014: 258). The increased awareness regarding the urgent environmental and socio-cultural problems of the fashion industry has led to a renewed focus on the value of local and transparent clothing production and manufacturing.

It is in this context that the research project 'Going Eco, Going Dutch' (2015–2017) explored how to develop a transparent circular economy on a local scale. Local textile manufacturers and fashion brands closely collaborated to investigate how to develop fashionable textiles made from recycled post-consumer textiles and from locally produced hemp – from the very first fiber to the final branding of the fashion product. All partners in the production chain actively collaborated in order to research three main questions: 1) what are the technical possibilities to optimize the production of locally produced hemp to make high-quality textiles, ready for the fashion market?; 2) what are the main implications for the fashion design process, and what new sustainable design strategies should be taken into account?; 3) how should the locality, the sustainability and transparency of the production of these textiles and fashion products be branded and marketed in a successful way to reach the consumer?

In this paper we will present the most important findings of the project 'Going Eco, Going Dutch' with regard to the circularity of locally produced cloth made from post-consumer textiles and hemp. This paper will highlight the importance of local production processes for a circular and transparent system. Physical proximity enables close collaboration and a valuable interaction between all stakeholders in the supply chain. We will also reflect on the changing role of both scientists and designers, in which involvement and co-creation in the early stages of material development and production is essential. In doing so, we will also highlight the designer's capacity to contribute to the aesthetic and personal value of local circular fashion of sustainability, by drawing upon the theories developed by Kristine Harper (2017) and Jonathan Chapman (2009, 2015).

Local materials and production: hemp and recycled post-consumer textiles

The project 'Going Eco, Going Dutch' brought together local textile manufacturers, suppliers, designers and fashion experts in order to find and test new ways of local sustainable production methods and circular design principles.

1. This quote is presented on the website of the Ellen MacArthur Foundation, see: <https://www.ellenmacarthurfoundation.org/news/new-circular-fibres-initiative-brings-industry-together-to-build-a-circular-economy-for-textiles>

Through an interdisciplinary approach, this project combined a scientific study and technical exploration of textiles, design research and creative practice. In developing a local circular economy, all actors in the supply chain worked together to develop new sustainable fabrics for applications in the fashion industry. As the textile and clothing industry is the world's second-largest economic activity in terms of trade, the concern of the environmental impact of the industry has grown over the years. Generally, this includes the energy use, greenhouse gas emissions, nutrient releases and eco-toxicity from washing and dyeing of textiles as well as significant water use. The active collaboration between all actors along the supply chain from producers to consumers play an important role in reducing the environmental footprint of textile products (Retail Forum for Sustainability, 2013).

Moreover, in the Netherlands only one-third (ca. 70,000 tons/year) of the discarded clothing and household textiles is collected as post-consumer textiles. This is mostly collected by charities that directly sell to commercial sort companies. These companies sort out the clothing and household textiles by hand in ca. 300 groups. 50% of these textiles are sorted as second-hand clothes and are sold in thrift shops, and the remainder goes largely to Africa. The sorted not-reusable textiles, in the Netherlands ca. 40,000 tons/year, is used for cleaning and low-grade recycling (Texperium, n.d.). The project 'Going Eco, Going Dutch' starts from the conviction that the textile chain can be made more sustainable by improved textile collection, recycling of textile materials and high-quality reuse. The spinning of yarns made from high recycled fibers should be business as usual, and we need close cooperation and alignment between the different production steps, textile partners and designers to develop a circular chain. 'Going Eco, Going Dutch' therefore used an integrated systemic approach to develop yarns from both recycled post-consumer textile and from locally produced hemp.

Hemp has a long history in the Netherlands and brings along excellent characteristics with broad application possibilities and a low environmental impact. Hemp is one of the first plants cultivated and one of the oldest non-food crops. It is a multi-purpose crop, grown for its bast and wood fibers, its seeds, its oil, and its cannabinoids. The historical use for medicinal and narcotic use of *Cannabis Sativa L.* dates back at least 5000 years, and the use of the seed oil at least 3000 years. As a textile fiber, however, it is probably even longer. The oldest remains of hemp cloth are estimated to be about 6000 years old. Hemp bast fibers are among the strongest and most durable of all vegetable fibers. Fiber hemp has widely been used as a textile fiber for hundreds of years. The Netherlands had a peak of its fiber hemp production in the seventeenth and eighteenth century, because the basic equipment of sailing ships was largely dependent upon the cultivation and processing of hemp. Canvas sails, ropes, fishing nets, but also uniforms were made of the weather-proof fibers (Westerhuis, 2016).

Compared to cotton, hemp has many environmental benefits: 'The environmental issues when growing cotton are huge; extreme water usage, very high amounts of chemicals are used, and the use of too much land (that could also produce food). Hemp has none of these issues'.² Yet, one of the problems when using hemp is the hardness of the material itself. One of the partners in the project, StexFibers, has developed a technique to soften hemp fibers. In recent years, StexFibers collaborated with the Dutch University of Wageningen to adjust the existing technique of steam explosion (meant to open up the hemp fibers). This technique was adjusted in such a way that hemp fibers after treatment could be spun on existing spinning equipment. This enables the use of hemp for high quality textiles. The spinning experiments with hemp took place at Texperium Innovation and Research Center in Haaksbergen, the Netherlands.³ During spinning it turned out that 100% hemp was still hard to process. The yarn often broke due to the hardness of the fiber. For that reason, it was decided to make a hemp blend with recycled denim to make the yarn stronger and with more elongation.⁴

2. For more information, see: www.stexfibers.com/.

3. The tryouts were performed at the "Schlafhorst Autocoro ACO 288 FU" open-end rotor spinning machine. This machine is delivered with 24 spinning positions and an automatic breakage detection device.

4. Students of Saxion University of Applied Sciences actively contributed to the development of these yarns.

In addition to the yarns from hemp, post-consumer denim was thus used to develop recycled yarns. In the process of collecting and recycling used garments, this project focused on 'unraveling'. Unraveling is a process in which post-consumer textiles (in this case, denim) are fiberized while unwanted material is removed. The yarns from recycled post-consumer textiles were developed through mechanic recycling: all discarded garments were collected, sorted, cut, cleaned, carded, etc. As this point, mechanical recycling 'offers the most sustainable in recycling textiles in general, which avoids changing the chemical composition of the fibers and simultaneously fortifying the fiber itself. It is also the most scalable method when it comes to post-consumer waste' (Gould, 2015, cited in De Brouwer, 2017). Each step of the process of mechanical recycling has different effect on the fibers and it is important to clearly differentiate between raw materials and the materials that are going to be recycled. The development of yarns entails three phases:

- (1) fiber preparation (i.e. sorting, cutting, shredding, carding, and blending);
- (2) yarn spinning (i.e. machine set up, material composition);
- (3) yarn testing (i.e. test set up according to ISO standards, and evaluation of results).

All yarns were tested in the laboratory in order to explore the quality standards and main characteristics of the produced yarn according to ISO/ASTM standards.⁵ In addition, after developing a yarn, the life-cycle assessments (LCA) standard tool was used to investigate the environmental impacts of all stages of the product's life.⁶ The results of the tests of yarns made from 50% hemp and 50% recycled denim confirm that these yarns lead to significantly less CO₂-emission, less energy use and less water use.⁷ Although there are still technical challenges when developing yarns made from 100% hemp, these results show the great environmental potential of locally grown hemp for applications in fashionable textiles.

Designing Aesthetic Sustainability

In terms of materials and production processes, yarns made of locally produced hemp and recycled denim have a great potential environmentally. This local production of local materials evidently also has implications for the design process. In the field of fashion and textile design, we observe that the role of both scientists and designers is changing. It is increasingly important for designers to be actively involved in the development of materials and in production processes instead of only making a beautiful end product after the technical development is finished. Product development thus becomes a process of co-creation where designers and scientists start from the same goal: finding a sustainable solution. Starting from a human approach and an understanding of what kind of products people want to be associated with, designers will be more and more actively involved in the development of different fibers and the products made out of these fibers. In order to design in a sustainable and circular way, it is essential for scientists and designers to start their collaboration at a very early stage. In doing so, fashion practitioners will increasingly be aware of where materials and fibers come from, and will increasingly include the entire life cycle of the garments in the design process.

Today, there are many initiatives focused on circular design, such as 'zero waste design' (Rissanen & McQuillan, 2015), 'upcycling' (Braungart & McDonough, 2013), 'design for disassembly' (see e.g. Webster, 2013), and 'design for longevity'.⁸ See e.g. Danish Fashion Institute, 2017. Anna Brismar, who first coined the term 'circular fashion' (2014), identified sixteen key principles to support and promote a more circular and sustainable fashion. The first 5 principles

5. The yarns were tested on: (1) Yarn strength ISO 6939:1988; (2) Yarn count/Linear density ASTM D 1907-01; (3) Elongation at breakage ISO 2062:2009; (4) Evenness and hairiness ASTM D 1425-60T; (5) Yarn twist ISO 2061:1995.

6. The Modint Ecotool was used to calculate the environmental impact of the whole product and parts of it. Modint is the Dutch trade association for fashion and (interior) textiles.

7. In the calculations, the processes were standardized as much as possible, in order to be able to compare the results. Assumptions were made with respect to recycled materials in the pre-treatment (no scouring and bleaching of the recycled content) and coloring (no dyeing or printing of the fabrics containing recycled content, as the recycled materials can be sorted based on their color).

8. For more information about design for longevity, see the website <https://designforlongevity.com/>, an initiative of the Danish Fashion Institute (2017).

are focused on design as well: 1) design with a purpose; 2) design for longevity; 3) design for resource efficiency; 4) design for biodegradability; 5) design for recyclability.⁹

There is an increased awareness that fashion designers have the opportunity to change the way products and materials are made, use and disposed of. This was also emphasized in the report 'Closing the Loop' by researcher Zinzi de Brouwer (2017), an important part of the research project 'Going Eco, Going Dutch'. As this report points out.

As carriers of change, [fashion designers] are able to positively contribute to environmental and social impacts, re-utilising products and materials that will be part of the future of closed-loop systems. In order to do so, it is crucial these creative makers understand the complete lifecycle of the textiles and products that are being utilised in practice (De Brouwer, 2017).

Here, it is important to make a distinction between design for recycling and recycling in design. Whereas the latter entails using recycled materials in the design, design for recycling implies that designers take into account the entire life cycle of the product. Design for recycling methods can extend the 'life-cycle of a garment [...] up to 4 times in which materials are re-utilised' (Luiken, 2016, interviewed by De Brouwer, 2017). The report 'Closing the Loop' (2017) offers many concrete and practical guidelines that are essential for designers with regard to the fibers, yarns, materials, labels, haberdashery, measure, design, color, pattern cutting, production, waste, packaging, etc. (De Brouwer, 2017: 19-29).

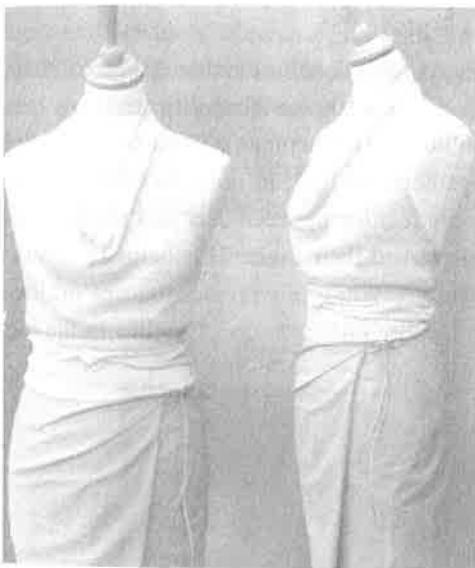


Figure 1 Moyzo



Figure 2 Tous les Chéris

This report also highlights the importance for designers to build close relationships with all actors in the supply chain, especially with the manufacturer: 'seeing first-hand how the factories work, what their conditions are like and the people behind the products is key to knowing that you are acting in a fair, respectful way' (De Brouwer, 2017: 24). The close relationship between designer and manufacturer has greatly affected the creative process of the designers of Tous les Chéris (a local Dutch baby clothes brand) and Moyzo (a local Dutch fair trade fashion label). The creative designers of these local brands used the yarns made from hemp and recycled denim to weave cloth and knit fashionable textiles. In addition, they worked according to the design for recycling principles. For example, Moyzo designed a prototype wrap top from yarn that consists of hemp and viscose. All prototypes are made to be easily recycled. Tous les Chéris also experimented with the yarns to knit and/or weave cloth for prototypes of baby clothes.

⁹ More information on these circular fashion principles, as defined by Anna Brismar, can be found on: circularfashion.com/key-principles/.

Whereas the quality of the material still needs to improve, the increased knowledge about the local materials and production processes fundamentally changed the design process. In their design process, both Moyzo and Tous les Chéris take into account the entire production process and life cycle of a garment, which helps to create fashionable clothes that are easily recyclable and upcyclable.

With regard to designing for recycling, the underlying design values are essential. As the report 'Closing the Loop' (2017) argues, developing design values – focused on human valuing and working together – is crucial to adhering to the philosophy of recycling. Designers are then no longer used to make an end product, but it is about engaging with materials in a more ethical way. The focus on values in the design process was an important part of the workshop 'Cooperative Crafting' by fashion designer, artist and educator Pascale Gatzen, as part of the project 'Going Eco, Going Dutch'.¹⁰ This workshop explored the possibilities for design in a circular system from a personal perspective, starting from the designers' core values that help to define their role as a designer. Based on these personal, human values, the designers created new strategies, systems and forms for the future of fashion. For example, for the 'Archive of Intimacy', designer Gala Borovic developed a design strategy based on personal bonding with consumers by translating their personal and aesthetic story into a garment. This workshop demonstrated the importance of redefining the values from which we work and design. As De Brouwer already pointed out, 'designing extends beyond the product; it involves people and society' (2017). In order to design in a more ethical, circular and sustainable way, it is thus essential to redefine our relationship to the material resources of the earth and to revalue our relationship to the wearer. These are fundamental elements of a circular design philosophy.

This personal approach is central to the theory of Jonathan Chapman on 'emotionally durable design' (2009, 2015). Building upon the work of Ann Thorpe and Kate Fletcher, Chapman argues that 'the sustainability crisis is a behavioral issue, and not one simply of technology, production, and volume' (2009: 29). Chapman's work thus highlights the importance of sustainable design for emotional durability, i.e. 'empathetic design', in order to extend product life and reducing consumption. Importantly, this approach acknowledges the relation between user and product, and aims to design for deeper and more meaningful relationships between objects and their users. This helps to contextualize an important part of the design philosophy of 'Going Eco, Going Dutch'. While this project focuses on locality in terms of locally grown materials and local production processes, the locality of this project also lies in the close and

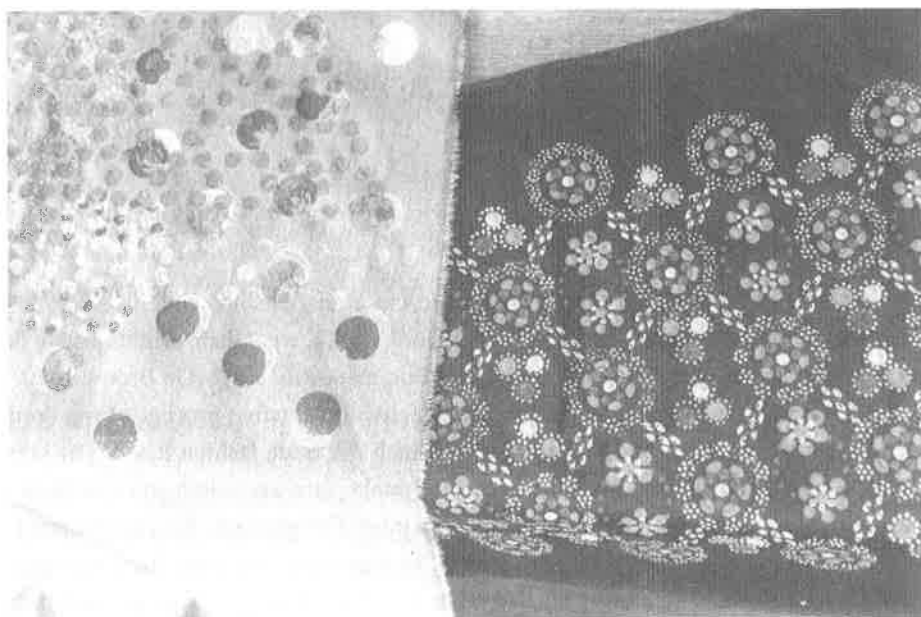


Figure 3 Traditional Dutch crafts (Staphorster Stipwerk) on hemp textiles

10. This workshop was meant for students of the MA Fashion Design at ArtEZ University of the Arts, The Netherlands.

personal connection between user (i.e. maker or wearer) and material object, which was demonstrated in the workshop 'Cooperative Crafting'. Physical proximity thus is essential when moving towards a circular fashion system.

The personal connection between user and product is also emphasized in the work of Kristine Harper. In her new book *Aesthetic Sustainability* (2017), she highlights the emotional connection between material object and the consumer, and the importance of the aesthetic value of sustainable fashion design. As she argues, 'these are objects that consumers will want to look after, repair, and ultimately, pass on' (2017). This aesthetic dimension of sustainable materials was also explored in 'Going Eco, Going Dutch' by experimenting with coloring and printing of the hemp textiles. In collaboration with the Dutch Crafts Council, three different techniques of visually ennobling textiles were used: block printing, Staphorster Stipwerk (dotting) and embroidery.

These traditional crafts were translated to a modern design in order to create added value to these local materials by highlighting its visual aesthetics and creating a unique visual identity. Since these crafts were used in traditional Dutch costume, this approach highlights the Dutch locality – the symbolic Dutchness – of the textiles while contributing to the aesthetic value of sustainable textiles.

Sustainable narratives of Dutchness and personal locality

In addition to circular design strategies focused on local materials and production processes, 'Going Eco, Going Dutch' also offers insight into the importance of redefining and redesigning the personal and emotional relationship between consumers and products. Moreover, it highlights the significance of the aesthetic and symbolic value of developing fashionable locally produced sustainable textiles. These elements are also crucial to the development of branding and marketing strategies in order to reach the consumer.

In order to investigate how to brand the locality, sustainability and transparency of these locally produced textiles, a collective platform and thinking laboratory Van O was initiated as part of 'Going Eco, Going Dutch'.¹¹ Instead of a



Figure 4 An impression of the books by Van O



Figure 5 Chain of beads by IoSphere

11. This was an initiative of the MA Fashion Strategy students, at ArtEZ University of the Arts, under the supervision of Studio by Judith ter Haar.

typical branding strategy, this creative agency focused on forecasting and storytelling while creating new visions on the future of the circular economy. These creative practitioners explored how to collectively – in collaboration with all project partners – develop a sustainable and resilient branding narrative. As part of Van O, these fashion strategists developed a forecasting and design proposal in the form a box containing three books. Values, storytelling, educating the consumer and aiming to change the system formed the core of the research. Van O defined the values based on which designers could develop products. Important values are transparency, honesty, collectivity, togetherness, honoring materials and traditions, and embracing that which needs to be repaired.

This creative agency developed into the forecasting collective IoSphere to further develop the branding strategy for sustainable hemp fiber.¹² The creative fashion strategists created six identities that together formed a new ecosystem with the aim to transcend the current system and to create awareness. Each identity explored the role of hemp in their envisioned ethic of care. There was the co-exister (earth sustaining), the dream connector (imagination), ever changer (diversity), hive minder (locality), limit breaker (freedom) and moral sensor (transparency). Not only did these six identities relate to the individual identities of the creative practitioners, but they also referred to the inherent qualities of locally grown and sustainable hemp.

To tell their story, they created an art installation that featured a chain of beads where each set of beads symbolized one of the six IoSphere identities. In addition to the chain they also presented their manifestos, which again reinforced the idea that sustainability is closely related to emotional connectivity; the stronger the consumer relates on an emotional level to a brand or product, the more inclined he/she will be to use it for a prolonged period. This leads to the idea that sustainability should not only be present in the product itself, but even more so in the narrative “selling” that product, because it is through imaginative storytelling that the customers connects.

This approach again builds upon the insights of Jonathan Chapman. In *Emotional Durable Design: Objects, Experiences and Empathy* (2015), he states five factors that are involved in creating an emotional durable product: (1) narrative, how can users share a unique personal history with the product; (2) fiction, the product inspires interactions and connections beyond just the physical relationship; (3) surface, how the product ages and develops character through age and time; (4) attachment, can the user be made to feel a strong emotional attachment to the product; (5) consciousness, how the product is perceived as autonomous and in possession of its own free will. Both Van O and IoSphere focused on narrative, fiction and attachment in their branding strategy of these emotionally durable objects. This helps to understand the importance of storytelling by focusing on locality, and on creating an emotional bond between producer, product and consumer. Here, again, the locality also lies in the personal connection and physical proximity between maker/wearer and material fashion object.

In addition to these personal values, ‘Going Eco, Going Dutch’ also created narratives of locality in terms of Dutchness due to the symbolic Dutch value of hemp and of traditional Dutch crafts. In a final design workshop of this project, pigment made of local tulip waste will be used to color non-woven textiles made from hemp.¹³ The use of tulips again enhances the symbolic narrative of Dutchness. In the tradition of Dutch fashion, we can often find cliché icons of Dutch culture, such as Delft Blue earthenware, regional dress, and tulips. Yet, at the same time, we must acknowledge that these icons often originally derive from elsewhere and are always ‘shot through with cultural hybridity’ (Smelik, Bruggeman and Feitsma, 2017: 85). For example, while the tulip originally came from Turkey, it has become the typical symbol for Dutch culture. While the tulips and hemp in this project contribute to the creation of a narrative of Dutchness, it is important to acknowledge that this is mere a symbolic performance of Dutchness. There are always other (global) cultural influences at the heart of created narratives of local Dutchness.

Nevertheless, the locality of the project ‘Going Eco, Going Dutch’ lies in the locally grown fibers, the locally produced

12. The new generation of MA Fashion strategy at ArtEZ University of the Arts continued and further developed this research into a branding strategy.

13. We will use the tulip pigment made by Tjeerd Veenhoven. For more information, see: http://www.tjeerdveenhoven.com/portfolio_page/tulip-pigments/

materials, the local producers and manufacturers, and in the local designers and fashion strategists who all collaborated to investigate how to optimize a local circular fashion system.

Conclusion

The project 'Going Eco, Going Dutch' foregrounded the importance of physical proximity between all actors in the supply chain, which is essential for a circular fashion system on a local scale. This confirms that 'inextricably linked aesthetic and industrial practices can contribute to more sustainable and more responsible supply chains' (Köppchen, 2014: 267). A process of co-creation between scientists and designers is essential in order to optimize recycling and upcycling. If scientists and designers collaborate in both design for recycling and recycling in design, they can potentially have more impact to guide fashion production and consumption into a more sustainable and circular future. The designer also has an important role in contributing to the value creation of these materials by highlighting and redefining the aesthetic dimension, the emotional connection and personal values of locally produced sustainable textiles. This is inextricably interconnected to the creation of narratives and storytelling to enhance and redefine the relationship between consumers and material objects. Whereas Dutchness is a symbolic construction, this project does confirm the necessity of going local in order to move towards a circular fashion system.

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