

Louvain School of Management

**The Denim market; Research on the
current manufacturing conditions
from the point of view of
sustainable development**

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Summary: The textile industry is producing more and more and moving further and further away. One of the most polluting garments in this sector is denim. The consequences for the environment and foreign workers are considerable. In this article, I will look at internationally renowned companies and others more underground that sell in Belgium and see what their commitments are. Together, we will see if Belgian consumers have the opportunity to buy more sustainable products today.

Keywords: Belgian market, Jeans, sustainable production, social issues, environmental issues.

Résumé : L'industrie textile produit de plus en plus et va s'installer toujours plus loin. L'un des vêtements les plus polluants de ce secteur est le Jean. Les conséquences pour l'environnement et les travailleurs étrangers sont considérables. Dans cet article, je vais me pencher sur le cas d'entreprises de renommé internationale et d'autres moins connues qui vendent en Belgique et voir quels sont leurs engagements. Ensemble, nous verrons, si aujourd'hui les consommateurs belges ont la possibilité d'acheter des produits plus durables.

Mots clés : Marché belge, Jeans, production durable, questions sociales, questions environnementales.

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This work is dedicated to my grandmothers, Inocenta Moro-Benites and Maria Diana who were both child workers, and my grandfather, Domenico Disconzi who was a victim of silicosis.

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Introduction

What's more common than a good old blue Jean in our closet would you say? This garment popularized by Levis Stauss for the gold diggers and miners almost 150 years ago is present everywhere in the world. Well, Jeans today have become one of the most problematic garments of today's generation. Indeed, degradation of the environment, pollution of clean water, and serious damage to the producers on the other side of the world; are all that finish of the time in a mountain of waste not taken care of. And if a simple purchase of this emblematic garment that seems so harmless, wouldn't be so insignificant.

To face this huge problem, large companies but also craftsmen are trying to find solutions. But what about the situation at the market level?

Within the framework of my thesis, I will answer the following question: *"Is there a sustainable alternative in the Belgian market regarding the production of Denim? What are the solutions that have been put in place by these companies on this market?"*

To answer this question, it will be necessary to identify the problems related to the production of Jeans and to draw up the situation of the market in the broad sense then specifically in Belgium. The method will be to collect an exhaustive information base via existing databases and through a survey for consumption habits. Then, all solutions for the sector will be discussed and linked to a case study. A benchmark of products available on the national market will be realized. Finally, with the links made between these parts of the research and scenario, an assessment will be made.

The motivations that led me to look into this theme came from a report that I had seen on the working conditions of textile workers in Bangladesh. Afterward, I questioned my consumption and wanted to investigate the problems of this industry. As I got more and more familiar with the industry, I discovered that Jeans were the most polluting garment on the planet. It seemed natural to me to include the three pillars of sustainable development in my research, namely the social, environmental, and economic aspects. Secondly, I decided to choose this topic to put into practice several concepts I learned during my university studies, from Ethics and Marketing to Sustainable Management & Supply Chains.

1 Negative externality to the denim life cycle

There are several problems related to the manufacture of Jeans. The impact of the demand cannot be done on a local scale since the production of textile is not done locally anymore. All this implies major issues with globalized negative effects. To understand this situation and to check what are the alternatives in connection with these stakes, it will be necessary to synthesize and put them in connection with the actions already set up to fix them.

1.1 Problems related to production on the upstream of the production line

1.1.1 Environmental issues

The biggest problem with the manufacturing of Jeans is the quantity of water used to make the cotton grow. Indeed, the Jeans are made from a material called denim. This term designating the Jean itself appeals to the weaving borrowed by Levi's Strauss who used this resistant weaving of cotton that appeared for the first time in France in Nimes. There are several stages where the production requires water in huge quantities.

On average, it takes **4.000 liters** of water to produce the necessary quantity of cotton for a jean (not recycled).

In addition, the world's largest cotton producers such as the southern United States, Turkey, and India add powerful pesticides and fertilizers that get into the water table and poison the soil. Moreover, Cotton is vulgarly called "**WORLD'S DIRTIEST CROP**" for good reason, the exploitation of cotton is equivalent to 2.5% of all cultivated land but consumes 16% of pesticides dispersed on the planet. The concern is that cotton can be quickly invaded by insects such as moths and spiders that eat it to make webs. Getting rid of them is very difficult and requires more and more chemicals. The only solution is organic cotton certified by GOTS¹ but this type of plant still doesn't represent much of the global quantity delivered.

According to the OTA, the proportion was **0.95%** in 2018 with the following ranking of producing countries.

¹ GLOBAL ORGANIC TEXTILE STANDARD: Is an international label created in 2002 and which gathered four distinct labels

	 Organic Cotton Fiber (tonnes)	 Fiber Year-on-Year	 Share of global organic cotton production
 Global	249,153	3.9%	100%
 India	124,244	1.3%	49.8%
 China	30,589	-25.8%	12.3%
 Kyrgyzstan	29,415	24.4%	11.8%
 Turkey	24,288	6.3%	9.7%
 Tanzania	11,285	113.7%	4.5%
 Tajikistan	10,471	-14.0%	4.2%
 U.S.	6,913	33.9%	2.8%
 Uganda	4,734	83.4%	1.9%
 Pakistan	2,026	408.6%	0.8%
 Greece	1,720	47.2%	0.7%
 Benin	1,373	37.6%	0.6%
 Peru	712	27.7%	0.3%
 Burkina Faso	574	26.6%	0.2%
 Egypt	238	-17.2%	0.1%
 Uzbekistan	165	n/a	0.1%
 Ethiopia	148	13.8%	0.1%
 Brazil	134	37.8%	0.1%
 Mali	85	1.3%	0.03%
 Myanmar	32	n/a	0.01%
 Thailand	5	-17.5%	0.002%
 Senegal	3	n/a	0.001%

Source: Textile-Exchange_Organic-Cotton-Market-Report_2021

There are other steps where water is used in the process. In drying, dyeing, and bleaching. In such cases, the water is not wasted but polluted. The products used in these steps are corrosive. Ten years ago, Greenpeace alerted the situation of the shores around Xintang, the capital of Jeans with its more than **3.000 companies** dedicated to this industry. The water streams are so polluted that they have turned blue as a result of the release of copper and cadmium in the water.



(2018) Endemico: Blue River: the impact of jeans on rivers

This dose exceeds the maximum sanitary level by **130 times**. The inhabitants are forced to live close to what looks like a **poison pit in the sky**. Besides the health emergency, the local biodiversity is also affected. The problem is the lack of legislation and implementation of the wastewater treatment plants.



Students in Gurao (Xintang), The Guardian: The price of success/ China blighted by industrial pollution

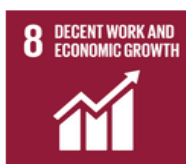
The developed countries have implemented ecological standards concerning the discharge of wastewater. Unfortunately, they do not have the means to implement them or do not have the will to do so.

Some estimates of "low-cost" Jeans are around **7 to 10 thousand liters of water consumption per unit**. Levi's, the Jeans giant, assures that from now on, a pair of its brand will take only 4 thousand liters of water to the confection in link with the 3 Global Goals of sustainable development.



Clean Water and Sanitation

The company has saved over 1 bn. liters of water through water savings commitments, and aim to increase the share of their Water<Less products to 80% by 2020.



Decent Work and Economic Growth

The 'Worker Well-being' programme is impacting nearly 100,000 workers. The initiative creates sustainable business and social benefits at all levels of the supply chain.



Life Below Water

The company is one of the first to create a restricted substances list, aiming to achieve zero discharge of hazardous chemicals by 2020, helping to protect life under water.

(2020) Levi's Strauss Global Goals

Finally, the recycling of Jeans into recycled cotton fibers also consumes a certain amount of water in the process. In each alternative, there is a cost, but this process is much less energy-consuming in terms of water consumption but still uses energy and water up to 400 liters. Furthermore, plastic fibers are also used for the flexibility of Jeans; each time they are washed, **microparticles of plastic are released into the water**. And this is even if they are from recycled plastic.

To summarize the impacts of the production of Jeans on the environment:

- impact on climate change (in kg of CO2 equivalent):
- Land acidification (in kg of SO2 equivalent),
- Eutrophication of waterways (in kg of Phosphorus equivalent),
- Overuse of agricultural land (in m2),
- Occupation of urban areas and parks (in m2),
- Transformation of natural areas (in m2)
- Use of water resources (in m3 of water),
- Use of fossil resources (in kg of oil equivalent).

1.1.2 Travel issues

About the environment, Jeans travels sometimes disproportionate distances. This environmental impact called carbon footprint or hidden costs gathers all the energy used; it implies directly or indirectly a Co2 rejection in the atmosphere. For example, electricity is not polluting by itself, but its production could be. Most of the Jeans are **travelling more than once around the world** to reach finally the stores.

To understand this, we need to retrace the journey of a typical Jeans and see how it is transported from the cotton production to the store where they will be sold. This presentation is based on the video of the French journalist Jamy Gourmand during the conference "The show for the earth"² that traces the journey of the jeans that crosses the longest way.

Cotton harvesting

The first step which consists of the production of cotton and its collection is done within the producer countries: China, Pakistan, and India, the three largest producers of the European market outside Europe. For our Jeans, its path will start in Lundhiana, India, as this country is **the world's largest cotton producer.**

Cotton weaving

Once the cotton has been harvested and packed, this raw material is sent to Pakistan, in Karachi to be spun and woven. At this stage, the cotton is transformed into a large web of cotton rows that will be wound into giant reels for easy transportation.

² Source : Jamy retrace l'itinéraire d'un jeans (2019) : <https://www.youtube.com/watch?v=U9xoi7RSOwo>

Processing into Denim fiber

To obtain a blue fabric like real denim, the cotton threads are sent to Xintang in China. There they are transformed into a canvas and dyed in indigo with **a synthetic pigment from oil**. It is necessary to add **4.800 km** to the counter.

Cut and assembly

The finished stuff is then sent to Tunisia where it will be cut and assembled with various accessories that are specific to the Jeans. This trip accounts for **9.500 km**. They add the small rivets which come in general from Australia, a zipper which is a Japanese specialty and finally the snap buttons and others come from Congo. If we take into account all the journeys for these countries we must add respectively **14.600 km** for the rivets, **10.600 km** for the zipper, and **4.000 km** for the buttons.

Shade treatment, spray, coloring, sanding

For the last part, the almost finished piece can be sent to Egypt or Dhaka in Bangladesh. That is **2. 200 km** or **7.800 km**. There, the Jeans will receive chemical treatments to imitate a wear discoloration. This method consists of sandblasting the Jeans which propels sand at high speed on the piece.

Getting to the store

Finally, the Jeans are stored in a warehouse before being shipped to Europe to be sold in stores with the help of dedicated retailers and brand promoters. In total, these Jeans from the globalized industry will have traveled **the equivalent of 1.5 times around the world**. In other words, **65.000 km**

This disaster scenario concerning a pair of Jeans sold in Europe is unfortunately much more widespread than we may think. The reason for this is the pressure on prices and the strategy to reduce production costs imposed by the businessmen inside companies. After the '70s, the production of clothing has relocated little by little. At the time, the overwhelming majority of these products were produced in a much shorter cycle or even locally. Today, **a minority of those are produced in an artisanal way**. For Tal's CEO, Roger LEE, "If a consumer looks at the prices of 20 years ago and compares them with today's prices, you will see a decrease in prices. This is not logical with the natural inflation of the economy and therefore the production costs". This is the reason why some companies continue to relocate their production further and further away.

At each stage of transformation, the seeded products and raw materials are transported in large quantities. The energy used for the transport is consequent compared to shorter circuits. These

transports from **delivery trucks to supertankers** are a huge loss of energy but benefit from their financial costs which are distributed on the economy creating labor costs in developing countries. This profit generation is a flight to "who will do for less" and this weight is exerted by the big negotiators on small production companies.

We can see that this model applied to all clothing also applies to the Jeans. The various steps that are made in developing countries are feasible in Europe. For example, sandblasting can be done in Turkey, and buttoning and gluing in Germany and also in Spain. And the finishing sees and many other steps in Italy.

1.1.3 Social issues

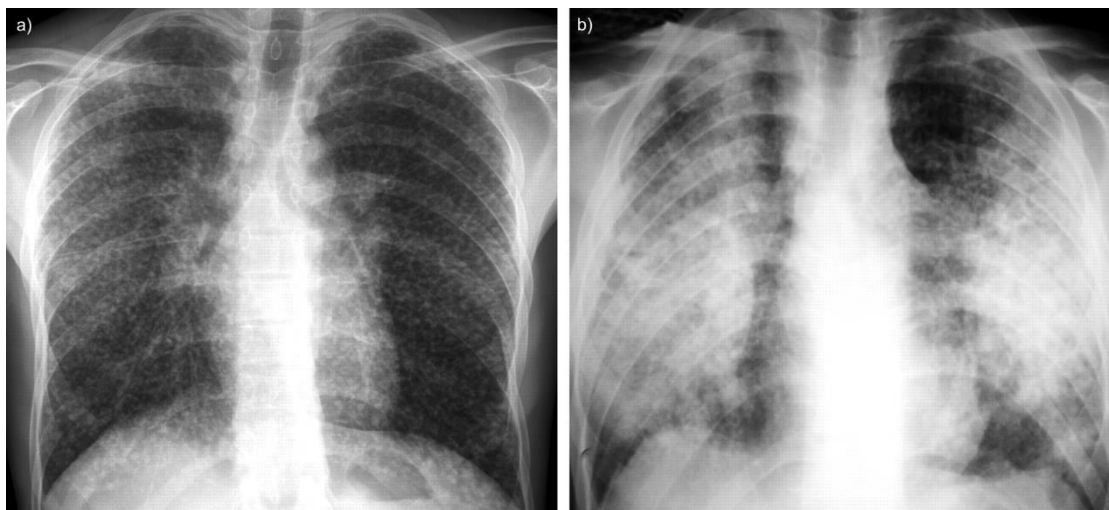
As we have previously seen in the various issues discussed, the production of Jeans has moved from local to global. **In other words, companies buy from wholesalers abroad without having direct control over these third-party producers.** In addition, worker protection and labor laws are not enforced for these forgotten workers in the supply chain.

There are two major problems in the exploitation of foreign workers. The first one is the imposed working hours and conditions. The second one is the exposure to toxic products or methods that induce a risk to the worker's health integrity.

Health complication

Among the processes that involve serious occupational diseases, we find various techniques of sandblasting in the finishing of Jeans. The sanding of the Jeans to give them an aspect wash has consequences if it does not respect the norms of securities, provoking, **in the long run, the silicosis.** This serious disease contracted in the past by the coal miners traumatized a whole European generation. It consists of progressive and **incurable degradation of the pulmonary alveoli caused by dust.** Chinese workers from the province of Guangdong testify in this sense: "In our department, it's full of Jeans and black dust. The temperature on the shop floor is high. It's difficult to breathe. I feel like I'm working in a coal mine."

Metin Akgun, a doctor and researcher at Ataturk University, also made the connection between the sanding of Jeans and the silicosis epidemics that have been occurring in Turkey since the mid-2000s. It is finally in 2019, that a report entitled "Bleached Souls" of Clean Clothes Campaign Turkey has established a postulate concerning the use of **Potassium Permanganate as the cause of serious respiratory disease.** This was followed by an obligation to treat and provide high-performance masks to continue this practice. Even though sandblasting has been denounced by the big companies and is in decline, it happens that other companies in the third world continue to use this method.



(2008) European Respiratory Journal: An epidemic of silicosis among former denim sandblasters (Turkey)

While awareness is growing in Turkey (quite closed to Europe), other workers from developing countries are not getting the same attention. In reality, few foreign workers are spared from exposure to serious professional diseases.

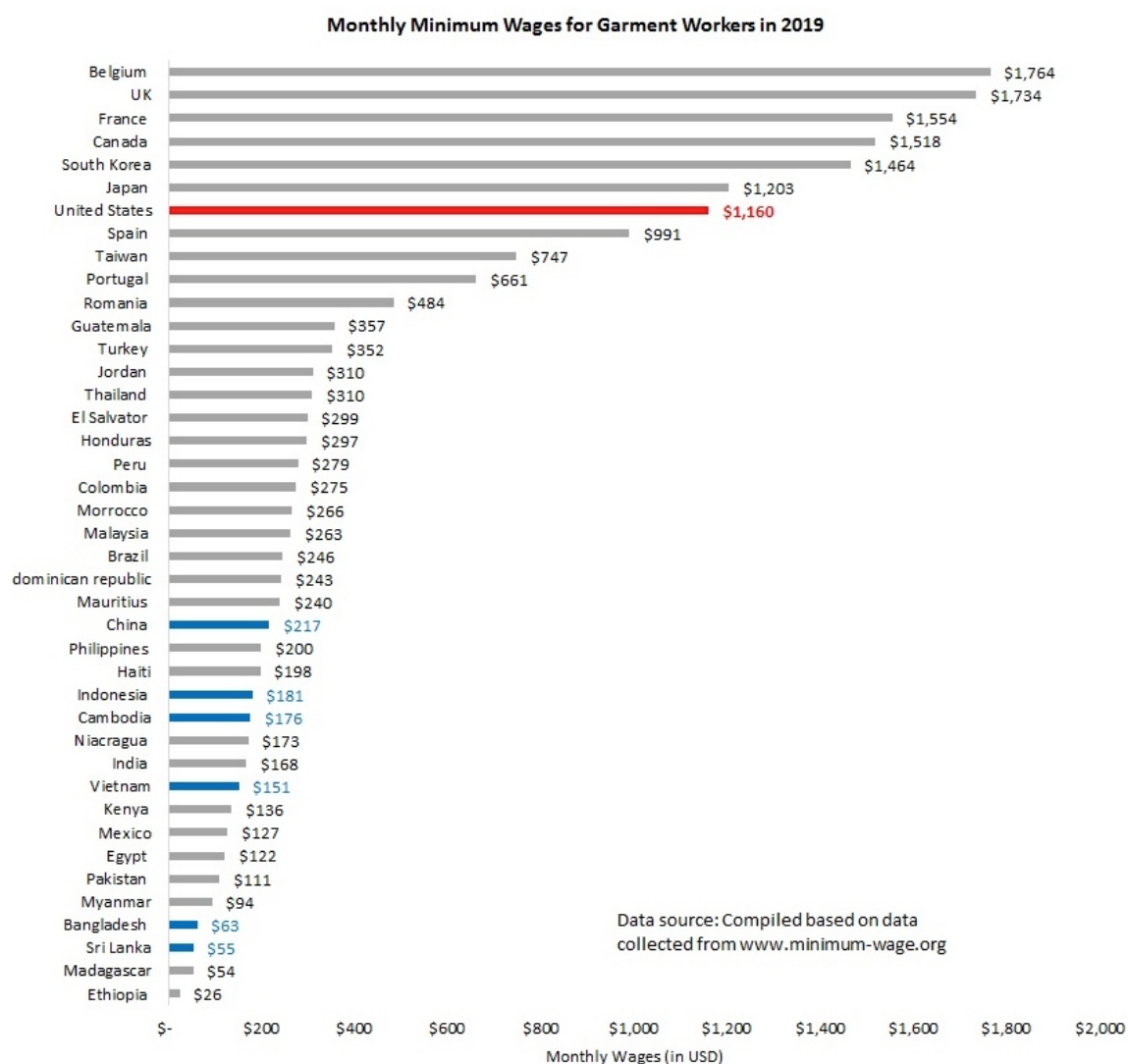
There is a latency between the legislation of developing and developed countries. For example, in Mali, **68% of the pesticides used for cotton growing are prohibited in all European countries and are recognized as carcinogenic**. The priority of these countries is unfortunately to develop certain competitiveness which will be a guarantee of their globalized economic involvement. For the moment, few means are available to them.

Lack of Work regulations for foreign workers

In addition to being exposed to health risks during the tasks to be accomplished for the elaboration of a Jeans, the foreign workers of the Third World and the developing countries are taken into a hellish spiral of the exploitation at work.

The work in these countries is not a career choice but a first necessity; it includes important **sacrifices from the inhabitants who have no choice but to get involved in a laborious and painful work** with often no contract of employment nor guarantee in case of an incident.

To illustrate the attractiveness of the companies for developing countries, which is also the surrogate experienced by the local workers, here is the list of average monthly salaries for textile workers in 2019.



(2020) University of Delaware: Department of Fashion & Apparel Studies

Concerning the working hours. Foreign workers usually work from **8 to 12 hours a day** depending on their needs they receive around **4 to 12 dollars a day** or **0.15 per piece of manufactured goods in China**. In addition, when they lack the means, the family may agree to make their child work. According to a report by the Overseas Development Institute (ODI), 15% of children in Dhaka's slums go to work full-time between the **ages of 6 and 14**. After the age of 14, this figure can reach 50%. These children can work up to 64 hours a week, they are generally paid less than adults and they suffer physical abuse. According to Maria Quattri, these children would like to go to school but she cites "poverty pushed their parents to find jobs for their children, even though they were aware that this would jeopardize their long-term future".

The situation is the same in the workshops in India. Up to that, in the cotton fields, **children make up 20% of the workforce**. In total in 2011, **4 million children** were still in the same age group concerned. The workshop leaders are aware of the laws in force in India and are playing with words about the 1989 law on the regularization and prohibition of child labor, which was

revised in 2016 but is still controversial. The textile economy is so lucrative that the government does not want to go into full repression against them.

In the disasters that have affected the textile sector, the whole world discovered this reality with the collapse of the Rana Plaza in Bangladesh. The employees were forced to work in a building that was already reported to be in danger of collapsing. In total, **more than 1000 people died and more than 2500 were injured**. The major clothing brands that worked in partnership with this giant factory mobilized after the scandal broke to develop building safety controls and to improve safety conditions such as electrical and fire standards. This initiative allowed to involve the big brands as well as the local government in this problem and revealed the existence of several malfunctions of well-known companies. However, small workshops where workers have dubious contracts still do not benefit from these basic safety standards and are not safe from a new disaster.

1.2 Downstream consumption problem: waste issues

We have seen that the production of denim is expensive in energy and raw material. The final quantities that are the result of this transformation are much less impressive than the quantities needed for this purpose. Among these elements, we have already mentioned: water, cotton, but also oil.

But another problem persists, what about the waste?

- The too-small cuts of fabrics,
- the defective products,
- and finally, the used Jeans.

As far as the companies are concerned, they do not communicate their production yield, but there is a loss in the cutting as well as in the defective products.

On average, **85% of the clothes we buy, end up in the garbage** and therefore in landfills or burned. In some countries, recycling or donating clothes is almost non-existent.



(2021) Buenos Air Times Chile's desert dumping ground for fast fashion leftovers

However, in Belgium, there is an efficient system of collection of used clothes that will be redistributed in virtuous circles. These clothes are sorted according to their condition and are reassigned. This national collection service works in partnership with NGOs that redistribute clothing in Africa or to the poorest for small amounts of money.

- 5% reuse via a network of second-hand stores in Belgium,
- 50% reuse for export via partner NGOs,
- 28% recycling (wiping cloth, stuffing, and fraying),
- 17 % final waste.

There are other ways to collect used Jeans. In stores such as C&A or many other independent stores, consumers can return their Jeans for a voucher. Consumers can also resell their jeans on secondhand websites like Vinted.

That said, there are always problems despite the means implemented.

- The awareness of the consumers,
- The fact that we don't know if this waste is reused properly,
- Brands don't like to have their product resold with their license,
- The explosion of Dropshipping³ and other poor-quality products are not recyclable.

³ Drop shipping is a form of e-commerce by which the seller site does not have stocks and has the final customer delivered directly by its supplier without, contains a pejorative connotation because the products are often issued of poor quality and resold much more expensive.

These problems are largely the result of fast fashion and the globalization of the textile industry. Although the Jeans are a more technical garment and are supposed to be more technical to realize, they have not been spared by this mode of production. The responsibility touches all the stakeholders involved from production to purchase, from the big companies to the workshop manager as well as the consumer.

2 Denim industry in the European market

In 2019, the European Jeans market represented **7.4 billion** euros for which 57% of the customers were men. This European market is undergoing a slight growth visible since 2015 of about **1.21%**.

To better understand the European market as a whole, it is necessary to analyze the stakeholders:

- Producers,
- Exporters,
- Importers,
- And customers.

For the imports and exports, we will talk about intra and extra-European exchange. The Jeans market in Europe is complex and reflects a complex industry based on interdependent contracts between companies located in Europe and outside, which guarantees an offer through vast areas.

2.1 The imports from outside of Europe

The import of Jeans from outside Europe includes both semi-processed and finished products. In this part of the global imports, the top 5 largest non-European exporters for 2020 are as follows.

Jeans exporting country	Amount in euro for 2020
Bangladesh	€906 M
Turkey	€795 M
Pakistan	€561 M
Tunisia	€282 M
China	€204 M

Source: Eurostat, Top Extra-EU Denim Exporters

However, the trend of market shares of these providers is decreasing a little bit every year to make room for more competition. We observe a decrease of about 2% of the exports for these countries with **a drastic decrease for China which has lost 18.6% in its European balance.**

The competition is therefore present in the field of textiles and the European Union helps industries via treaty to diversify trade and limit unfair competition. The international agreements between countries outside the EU with the European administration can also facilitate the access of certain other countries. This is the case of Vietnam which has seen its market share increase by 5.5% at the expense of current leaders with its treaty of the commercial agreement signed in 2019.

Concerning China, if it seems that its proportion of exports to Europe has decreased over the last year, it is important to remember that China keeps indirectly the largest market share. Indeed, Chinese companies have **relocated a part of their production to other countries where the labor is cheaper** and because of its higher internal inflation; this is particularly the case in “Cambodia”. China has also undergone a European regulation from 2005 to 2007 and had to expose itself to maximum export quotas as part of diversification standards of the textile market and the problem of inadequate working conditions. It is thus strong to bet that China and the Chinese companies are much more solicited than we think.

It has to be noted that US companies are not among the biggest suppliers of the European Jeans market. The leaders are located in Africa and Asia.

In general, there are different types of advantages to dealing with one country rather than another. For countries like Turkey, there is real proximity with Europe. For example, the goods can be brought by roads or by the Mediterranean Sea. This is shorter than for the Asian countries which have to go through the big Chinese ports which have bigger maritime traffic axes. The greatest strength of Asian countries can be explained by a great production leverage as with China with discounts and low production costs or products of a consistent quality for a low cost with Indonesia or Cambodia. The cheapest country in term of production remains Bangladesh.

2.2 The export intra Europe

Within Europe, the exchange of denim products is also to be taken into consideration. Several countries stand out in this sector. Here are the most important European exporters of Jeans.

European country importing jeans	Amount in euro for 2020
Germany	€1.4 B
Spain	€865 M
Netherlands	€718 M
Italy	€620 M
Poland	€540 M

Source : Eurostat, Top Intra-EU Denim Exporters

By looking at these figures, we notice very easily domination of some countries that are already famous for the manufacture of clothing as Spain and Italy with their numerous brands and groups of fast fashion to luxury products like Zara, Pull and Bear to Gucci. It is therefore obvious that these countries are major importers of semi-finished Jeans or finished products to then sell them throughout Europe.

For Germany, it is at the level of the culture that the Jeans took a more important place. Men and women go to work much more wearing denim than in other countries. Among the most famous brands, few are of German origin.

Brands	Headquarters
Diesel	Italy
Levi's and G-star	USA and Netherlands
Closed Mavi	Turkey
7 for all mankind / LTB	USA
Pepe Jeans	England
Replay	Italy
Jack and Jones	Denmark

Source: The Spinoff, Germany best known denim brand

Germany has a high internal demand within its country (the most populous European country with 83 million inhabitants) and has few recognized national brands. Yet, its industry is the leading exporter. This is all the more intriguing when you consider that many Jean's last steps are made in Italy and Spain. This is the case of Jack and Jones whose production is finished in Italy. **The German market is flooded by external brands.** At first, the American brands were highly appreciated, then came Mavi, the Turkish Giant, which has much more success with its quality-price ratio. However, many of the most popular German brands have their facilities, which reduces the import balance. This is the case of C&A (Belgium and Dutch) which has its facilities in Germany. In addition to these brands have their own activities. German brands also ensure the internal demand, like Mac, Mustang, Paddock's, and Jeans Fritz.

3 The Belgian Denims market

We have seen the general way the European market is composed. Now it is time for a more detailed analysis of the Belgian consumption pattern. For this purpose, a survey was conducted with a sample of 60 persons. This exercise aims to get personal data on a trend towards sustainable development.

The age ranges used are relative to the age of generations:

- Post-war, before 1945,
- Boomer First Generation, from 1945 to 1954,
- Boomer Second Generation, from 1955 to 1964,
- Generation x, from 1965 to 1980,
- Millennials, from 1981 to 1996,
- Generation z, after 1997.

3.1 What is the market share of each brand?

The first question is "which brands do Belgians buy the most? (3 brands maximum). The results on the whole population indicate that the most bought brands are in order,

Brands name	Number of times mentioned
Levi's	23
Zara	15
Tommy Hilfiger	12
Jack n Jones	11
Lee Cooper	10
Diesel	8

Source: Google survey

Taking into account the age of the participants, we notice that the tastes are comparable and that the brands attract large groups of consumers. However, we can observe a slight decrease in the popularity of older brands like Levi's with generation Z in favor of younger such as Diesel and fast fashion brands like Zara and Jules.

3.2 What is the position of Belgian consumers regarding sustainable development?

In connection with the negative externalities of the Denim production, I highlight two behavioral elements within my questions. The first is to focus on how consumers manage their consumption which has an indirect impact on the environment and social issues. The second is more based on the general analysis of consumer sensitivity to sustainable development and its challenges.

3.2.1 Behavioral approach and purchasing action

When buying a Jeans, have you ever been influenced by advertising?

When asked whether or not consumers had ever been influenced by an advertisement to buy Jeans, 30% (Appendix, Figure 1) of the consumers responded positively. However, brands communicate differently than in old times. Most of the advertising for Jeans brands is done via social networks or in-store. **The most responsive generation to advertising is the millennials and the Z's.** Later on, they were asked another question about buying Jeans based on an advertising that they will dress only a couple of times just to publish a picture on social media. The majority of respondents answered no. **But this proportion can increase from 17% to 29% if we compare the overall results with those of generation Z** (Appendix, figure 2). People with the least affinity for this type of practice were born between 1965 and 1996.

How often do you buy new Jeans?

We know that fast fashion brands are increasing the seasonality of their products. Jeans are a bit spared of it. **When we ask Belgians how often they buy denim, 50% of them follow half seasons or seasons** (Appendix, figure 3). A minority buy Jeans every two years and a third buy according to their needs at a specific time. Therefore, seasons do not impact the Jeans market.

Pick 3 items that are the most relevant for you when buying a Jeans

Among the assets that a pair of Jeans can present to the consumer, the priorities are mainly quality, esthetic, and practicality. The other two important components **are price and the number of years they will be able to wear them.** According to the BIO intelligence service study, the average life span of a Jeans is 8 years. Environmental sustainability and working conditions come last after the brand.

What do you do with your old Jeans that you no longer wear?

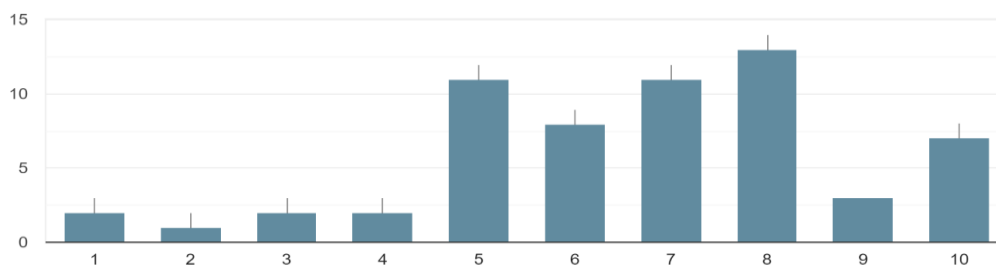
As far as the post-use life cycle of Denim is concerned, boomers will mainly put them in recycling, or donate them. **From generation x onwards, we see a small part of the participants throw them directly into the garbage** (Appendix Figure 4). The younger generation is more interested in selling or recycling.

3.2.2 Consumer Sensitivity to Jeans Industry Issues and Sustainable Development

For you, how important is the social responsibility of the producer of the Jeans you want to buy?

When asked how important Jeans are to workers, respondents were more likely to be moderately concerned than highly concerned. However, they had not previously prioritized this aspect when making a purchase. This appeals to a deep social desirability bias that emerges even in an anonymous survey. If people are informed about this issue, then they will become aware of the problem otherwise they will not pay attention and stay in the Denim. Generally speaking, if a person had a choice between a more ethical product that is promoted over a standard product and is aware of the issue, then customers will turn to that offer.

For you, how important is the social responsibility of the producer of the jeans you want to buy ?
60 réponses

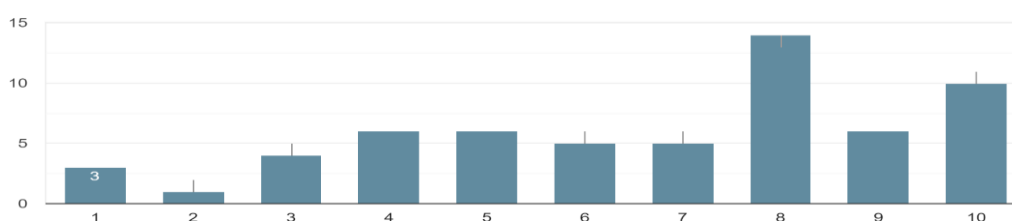


Source: Google survey

For you, how important is the environmental impact of the production of the Jeans you want to buy?

The same applies to sensitivity to environmental issues. Most people answered that they are involved in it, but they put it in the background. However, these issues have become more common over time and older generations who were not as aware of globalization are now aware of it via news, social networks, and wider information systems. We can say that there is a real awareness but that it must be done for each issue otherwise it will not be retained when making a purchase.

For you, how important is the environmental impact of the production of the jeans you want to buy ?
60 réponses



Source: Google survey

Do you take care about the origin, the raw material and the certifications of the Jeans you want to buy?

As far as raw materials, the origin, and the certificates are concerned, this question evokes several things for the consumers. Earlier, we said that one of the most sought-after assets was quality. So, all these proposals appeal more to that than to sustainability itself. **In people's minds quality is also associated with durability and longevity.** This is not always the case in the textile industry, although it may be related.

Have you ever bought a Jeans from a recycling or a shorter circuit?

Finally, the last point discussed was more concrete and related to course circuits. Here there can be no confusion. 36% of the respondents have already bought through short circuits. **In most cases, the persons who have used this method the most are older people.** The under-35s are less likely to do so.

3.3 Are the customers ready to pay more for more sustainable products?

The average price of Belgian jeans in 2022 is around **87.00 Euro** with the Levis 501 Jeans as the reference. The last question that will interest us is about the budgetary constraint of consumers. In a perspective where Jeans would be more durable than the others, the proportion of people in favor according to age is as follows:

- Boomers 75 %,
- Generation X 59%,
- Millennials 73%,
- Generation Z 46%.

These answers allow us to identify the real interest in a sustainable Jean buying opportunity and to draw a general conclusion. Boomers are generally more affluent and outside of life, so it is easier for them to turn to causes external to their environment. Generation X and Z are the least likely to make this purchase possibly because their priority is still focused on themselves and for the Z's because of financial issues. Millennials, surprisingly, are active young people and are willing to put more money into the cause possibly because they have been a generation that has been more aware of and saved by other phenomena.

4 Certificates

4.1 What are the different certificates for Denims?

There are a lot of certifications that apply to textile products and cover in length and breadth different problematics from exploitation to the end of production. In the case of Jeans, they are also concerned because they are included in this sector of activity. In order not to be too long, only the most common certifications will be explained. **Certifications are one of the solutions to curb the harmful consequences of the production of Jeans**

4.1.1 Management Certification

SA8000® Standard – Social Certification

Created in 1997 by Social Accountability International, this standard includes 8 criteria for factories and production organizations. It aims at improving **working conditions** for all and **equal treatment** for workers. These measures are the following:

- Child Labor,
- Forced or Compulsory Labor,
- Health and Safety,
- Freedom of Association & Right to Collective Bargaining,
- Discrimination,
- Disciplinary Practices,
- Working Hours,
- Remuneration,
- Management System.

The SA8000 certification is an affirmation of the company's respect for human rights in its management system and the company's ambition to implement more and more tools to improve the quality of work of all its workers.

ISO 9001:2015 – Quality Management Certification

It certifies the internal quality of a company's management and its innovation. It allows customers to have rendered on **the transparency and performance** of the company regarding its products. Each company having this accreditation also benefits from a consequent advantage in the market compared to its partners, suppliers/buyers.

4.1.2 Certification of raw materials

Process on raw materials

The standards (STeP) by OEKO-TEX® and Global Organic Textile Standard (GOTS) cover the entire manufacturing process of raw materials and semi-finished products. They include an audit of several stages and criteria of manufacturing such as:

- Chemical management,
- Environmental performance,
- Environmental management,
- Social responsibility,
- Quality management,
- Health protection and safety at work.

Regarding the raw materials used in the textiles, these must be in addition to the standards concerning the use of hazardous chemicals. To this end, the certifications are carried out by **an independent testing organization** to guarantee a full transparency.

Organic certification

All the components of the products must result from a vegetable culture. It concerns the plantation, and the use of products of type fertilizer or parasiticide. When one of these constraints is not respected, the product cannot be certified.

4.1.3 Recycling

Recycled labels

There are two ways to collect the raw materials that will be used to make certified recycled Jeans.

The first one is at the level of the production chain and allows to use the wastes, the defective products to recreate a new product. This method allows **improving the yields on the production** by reusing the losses of raw materials within the same company.

The second method is to harvest old Jeans.

- Either they will be dissected and crushed to obtain particles of wool and cotton daughters that will be used to recreate a new item,
- Or the recycling can be done chemically with decomposition baths for the old pieces of clothing.

This is called post-consumer recycling and reclaiming of used products.

In addition, there are also standards of recycled certification for the import of retransformed plastic in the composition of elastic fibers of Jeans. This is the case for companies like Levis who launched their WASTE LESS™ challenge, ten years ago. They estimated **that 20% of**

their Jeans would be made from plastic waste such as bottles. This initiative has allowed many other brands to use recycled plastic in their production of elastic fibers.

Recycling standardization process (GRS)

Global Recycled Standard is an independent, not-for-profit organization, that provides companies with a proprietary method of production and aims to **promote corporate sustainability**. The different themes addressed in their application to change production lines are the following:

- Composition of the recycled product,
- Maintaining traceability throughout the entire process,
- Restrictions on the use of chemicals,
- Compliance with environmental criteria - water supply, effluents, energy recovery,
- Respect for social criteria and workers' rights.

4.1.4 Cradle to Cradle Certified™ Product Standard

CToC™ is a process of transition and continuous improvement of a company's production chain to implement circular sourcing through **5 key concepts**:

- Materials health,
- Material's re-usage,
- Renewable energy and carbon management,
- Water management,
- Social equity.

The particularity of this certification is its completeness of verification but also a progressive **ranking system from bronze to gold** which allows the company in transition to be able to climb the ladder little by little.

Another strong point of this certification is its continuity and its requirements. Indeed, the companies must provide constant efforts of improvement; they are evaluated by an independent organization that gives this certification.

The best-known companies which offer certified CToC™ products are C&A and G-star; they both have the gold level which means that some products they sell are at the top of quality in terms of sustainable development.

4.1.5 Certification on chemicals

DETOX TO ZERO by OEKO-TEX®

The first certification DETOX TO ZERO by OEKO-TEX® is based on NGO Greenpeace and focuses on limiting the use of chemicals that are harmful to people and the environment.

The project allows companies **to look upstream of their production** and assess their impact based on the production chain with independent reports on water pollution, and sludge flow (concentration of polluted, chemically contaminated soil). Then, it is composed with the targets set by Greenpeace DETOX.

ECO PASSPORT by OEKO-TEX®

OEKO-TEX proposes its Eco passport is based on analyzing, with a fine-tooth comb, the various chemical products as well as all the compounds used in the manufacture of the textile products.

It evaluates their harmfulness and their application of **the international legal standards** as to their danger to the workers and the environment. Among these steps of check we find:

- A verification of each ingredient included in the datasheets of the products,
- A scientific verification made in the OEKO-TEX laboratory with independent experts,
- A visit of a controller concerning the exposure and the working conditions and also a verification of the waste management on the production sites.

The ZDHC Program

It is the result of a collaboration between various brands in the early 2010s which decided to fund a foundation that aims to develop a **comprehensive roadmap for the use of chemicals in textiles**. To do this, the foundation works with suppliers of products needed for the manufacture and processing of textiles. It has developed an audit technique on four points:

- MRSL & Conformance Guidance,
- Wastewater Quality,
- Audit Protocol,
- Research.

All this is under two key concepts Data & Disclosure and Training.

Several well-known groups such as Inditex, Nike, Levis, Gap LVMH, Addidas, and many others have contributed to the implementation of this project in the clothing production sector.

4.1.6 LCA (Life-Cycle Assessment)

Finally, the LCA (Life-Cycle Assessment) certification is part of a solution to a huge problem concerning the waste linked to the production but also the end of life of textile products. Indeed, if all the other certifications, previously seen, focus on the human or environmental aspect upstream of the production chain, it is very difficult to estimate the **pollution due to the consumption** of its products once they are thrown away. Of course, there is the recycling, but it is not 100% effective, and it represents only a very small part of textile waste in the world.

With the appearance of mountains of waste in Chile in the **Atacama Desert** but also in the **7th continent**⁴, it is very likely that such certifications and commitments will bring the big companies to take into account this issue linked to fast fashion and the overconsumption of clothing in the world.

In the textile sector, LCA can help:

- Not to focus on a single environmental issue,
- To manage the externalities of post-production/consumption,
- Develop a concrete policy of reuse of used products and guarantee the integrity of a more sustainable product life system.

4.2 Are those labels reliable?

To evaluate the impact and reliability of the labels, it is necessary to look at the method of obtaining them as well as the reputation of the organizations that offer their certification. In this process, there are several criteria to consider to evaluate the relevance of the titles used by the textile companies to promote their products. Therefore, the evaluation of the relevance will be based on

- The reputation of the label,
- The independence and non-collusion between experts and private companies,
- The impact and coherence with the issues related to the textile sector,
- The criteria for obtaining the label.

To start with the reputation of the labels. Bodies such as OEKO-TEX, ISO, MBDC (CToC™) are stewardship bodies that have based their missions on the improvement of the criteria included in their labels. They collaborate with other independent organizations such as NGOs. Their success is international, and their labels are available to brands worldwide.

⁴ The 7th continent is a pile of mainly plastic waste that has emerged in the Pacific and has been piled up by sea current phenomena. Sources: Le monde May 2012.

The relationship they have with brands is not compromised by financial interests as they do not require any. Brands rely on these labels for marketing purposes.

The role of these organizations is to shed light on issues that affect the textile sector and that involve negative consequences. Then, **the brands that are aware of the risks, which could represent low reliability and a bad image of their products**, decide strategically to change some aspects of their production chain. It is important to remember that large companies do not have as a primary goal to do ecology or social justice. It may be that people within the company are committed to these issues and change the course of action. **But their primary goal is profit and maintaining economic health over time.** Therefore, they are dependent on these labeling organizations to increase their sympathy capital. And not the other way around.

The labels represent a financial implication for the companies that want to adapt their manufacturing process. **Therefore, there is no reason for companies to require a certification that is not related to their business.** However, where confusion can be created is at the level of consumer sensitivity and their implications.

For example, if a company holds both the recycled label and the Oeko-Tex 100 label, it will create a product that is safe for human beings. But on the other hand, this product may not be sustainable in other aspects such as ecology or working conditions of employees. Therefore, a label alone does not define a product's sustainability. We have to see the certifications as a list of criteria that are acquired by the product and not believe that everything is directly universal. Fraud on a label does not exist in itself. But a brand can divert attention to problems that may or may not exist. For example, a product can be made from 100% organic cotton and be certified as such, and then be chemically treated. Similarly, the brand can be deceived in its chain of production. An intermediary company can subcontract a task such as sanding to dubious workshops and present a factory in standards on the assembly and the confection. **It is therefore very hard to keep an eye on all the steps.**

Finally, to obtain the certification, the company that goes to the organizations and each of the parties involved commits to a contract. Therefore, each label has means of verification, scientific or investigative, that allows them to give their validation. In other words, if there is a failure, a missing point, in the promise issued on the label with the actions of the company. **The responsibility will turn to the transmitter of the label.** If after obtaining the label the company goes against it, then the responsibility is that of the brand. In order to avoid this, labeling companies offer regular audits over a defined period. In conclusion, the label could be canceled.

4.3 What information about those labels do the consumers have in stores?

When the consumer is interested in the marked certifications on the Jeans sale, he could feel a little bit lost. Indeed, there is a multitude of certifications that are sometimes very specific and sometimes very broad. In addition, some certifications are applied to the broad sense of the brands; other certifications are specific to the brands or from a collaboration with suppliers or associations.

But one of the most important problems is the **communication on the final product and in the stores**. Indeed, when the customer wants to know about the quality of a product, he will rarely find a certification in the store at the level of the labeling. The information that often appears is the BIO logo. At the level of the characteristics, he can find the description of the product and its origin.

Jeans are often **sold through agents to individuals**. The sellers who negotiate these contracts are not bound by the more elaborate criteria of the big brands. They have most often the esthetics information and the sustainable attractions communicated by some brands that have based their sales model on sustainability. In the field, sustainability is more often used as a tool to increase turnover.

However, on some Jeans, the mention CToC™ or recycling appears in the pocket or inside of it, but it can get unnoticed at the time of purchase.

For questions of aesthetics, **the brand of Denim do not prefer to clutter their products with labels**. Their strategy is therefore to privilege the design to the communication to the consumer.

In the online stores, it is usually more detailed; the consumer will be able to see the proportion of raw materials used as well as some large descriptions like "organic" "100 cotton". The certifications of the products in reality depend on one of the suppliers; in other words, the concerned consumer has to go and sign up with the brand and on its website and try to find the supplier.

There is no direct appearance on the product or description in the stores whether they are online or physical.

5 Case study: G-star, an industrial company

G-Star is a Dutch company created by Jos van Tilburg in Amsterdam in 1989. The company is specialized in Denim and Jeans but also makes other clothes such as T-shirts and sweatshirts. The particularity of G-Star is its aggressive vision of the design of its clothes with marked features, and a factory finishes. The brand was inspired by the outdoor and military-style. It is a brand that targets mainly young people. Their credo "Hardcore Denim" **emphasizes unlimited inventiveness in the treatment of denim, counterculture**, and being pioneers of alternative style while respecting the impact of the company on people and the planet.

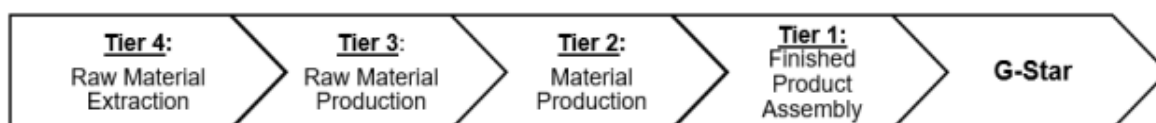
The values that flow from this mission are the following:

- Honesty,
- Innovation,
- Ambition "we are Eager".

5.1 What is the supply chain management of G-Star?

G-Star wants to show itself as a transparent company in its supply chain. This comes from its corporate values stated above, Honesty. In the denim industry, G-Star and Levi's are the two renowned companies that are known as **pioneers in trying to be the most communicative about their productions** towards their customers and stakeholders. To this end, G-Star makes **sustainability reports available to the public** and explains its sourcing process in broad terms. The first thing to know about G-Star is that the company does not produce Jeans and therefore buys finished products that are designed and relayed by order books to third parties.

The company has divided its supply chain as follows.



Source: G-Star Raw SUSTAINABLE SUPPLY CHAIN HANDBOOK (2021)

The company has contractual links with the Tier 1 factories by the intermediary of the agent's suppliers. These Tier 1 can also rely on the production or finishing of subcontractors. **More than 80% of Tier 1 comes from China, Vietnam, Bangladesh, and India.** Products are designed in the headquarters of the brand in the Netherlands. Once the product is ordered, it is delivered to the store or warehouse for online shops. The people in charge of the link between the sales points and the company are resellers of the company. Products are sold in dedicated stores, in private homes, in large clothing stores, and via online stores.

Even if for the moment the supply network is in constant variation and spread all over the world, mainly from Asia to Europe, **G-Starwants to consolidate and train its suppliers**. It allows the company to guarantee a better control of the production as well as the implementation of new techniques of confection which go in the direction of the values of the company.

5.2 Description of its certificates and sustainable process

G-Starhas developed several procedures that will apply to the suppliers of their products. The following information can be found in the supply chain handbook as well as in the sustainability report. To begin with, the company **submits a code of conduct⁵ to all its stakeholders**, covering the social and environmental spheres, to enforce its due diligence and compliance. To identify risks related to the business and the sector, the due diligence is based on **OECD due Diligence Guidance for Responsive Supply Chains in the Garment and Footwear Sector**.

Risk Categories			
Risk factor	Human Rights and Labor risks	Environment risks	Integrity risks
	Child labor Discrimination & Gender-based violence Forced Labor (Excessive) Working hours Occupational Health & Safety Freedom of Association Minimum Wages Living Wages	Hazardous Chemical Water consumption Water pollution Greenhouse Gas (GHG) emissions	Bribery and corruption

Source: G-Star Raw SUSTAINABLE SUPPLY CHAIN HANDBOOK (2021)

In addition to this matrix, G-Starincludes the risk of abuse and respect for animal life because about 1-2% of the raw materials used for its products are from animal origin.

New suppliers who want to deal with G-Star must be audited. For this purpose, the company performs a two-part risk assessment.

⁵ Overview of commitments in the declaration in Appendix Figure 5

Who wants to deal with G star, has to be audited. A cell has been created in this perspective and it's called "the sustainability department". The criteria for membership are elaborated according to the influence of the OECD matrix and using external sources regarding the risk assessment of the supplier according to his country.

External sources for Environmental risks assessment	External sources for social risks assessment
The Higg Materials Sustainability Index (MSI) WWF water Risk Filter Tool Quantis Zero Discharge of Hazardous Chemicals (ZDHC) McKinsey & Company	GoBlu International Labor Organization (ILO) Fair Labor Association (FLA) Fair wear Foundation (FWF) CNV Global Slavery Index Clean Clothes Campaign (CCC) Human Rights Watch Global Living Wage Coalition Corruption Perception Index

Source: G-Star Raw SUSTAINABLE SUPPLY CHAIN HANDBOOK (2021)

The new suppliers can be retained only when all the control procedures and the respect of the obligations imposed by the contract with G-Star are done. An annual audit procedure is set with all suppliers to ensure compliance. The factories are checked on-site by G-star employees or by a third agent. All pieces of information on improvements are reported to the data collection department and a follow-up is launched throughout the year. Once the data collection is done, **the acceptance must be done by the sustainability services.**

The supplier monitoring system is subject to other social and environmental control standards such as the Higg Materials Sustainability Index, and Higg Facility Social and Labor Module. Every year, G-Star gathers all its third parties 1 and 2 and submits them a survey and challenges to move towards a more sustainable supply chain. **The objectives set by the company by 2025 are that the range is 20% Cradle to Cradle certified and that 80% of the range is from recycled products.** This is notably the case with their project RAW for the Oceans in collaboration with Bionic and Parley. To counteract clothing waste, G-Star also has implemented its own "Certified Tailors" certification. The company has gathered and trained Jean's professionals who aim to repair damaged products and increase their life cycle.

Finally, G-star aims to be a transparent company. However, it doesn't communicate the names of its suppliers and uses a control system only on its third parties 1 and 2. Of course, its partners in sustainable projects are named, but no supplier companies are mentioned in its report or on their website. Therefore, the methods implemented to guarantee the integrity of its production is not complete.

5.3 Position and strategy of the Company

In its positioning, G-Star wants to be a brand that is associated with an alternative mentality. Its basic military inspiration has evolved to give this trend wider, (biker, young person). G-Star seeks at all costs to differentiate itself from its competitors and to innovate in the field of denim with the **advanced technology of confection and 3D cut**. In addition, G-Star focuses on the durability of products and wants to impose itself as a brand better than others. To promote its products, the company calls upon renowned personalities and designers. In early 2016, Pharrell Williams became the brand's ambassador and co-owner. He hypothesized that this brand of independent Jeans could become **the most popular in the 21st century**.

As for its communication, the means used are more digitalized. We find the brand on social networks like Instagram and Pinterest promoting its collection with models. And in-store, it is at the level of the display that the products are arranged in a row, on large shelves. The style that is present everywhere around the products reminds the small rock clothing stores. Also, **products look grunge-like in the 80s-90s** and blend well with the values of the culture wished by the company.

In terms of consumer feedback, the Jeans are described as quality with their own design. The price remains affordable but is higher than the European average of 60 to 80 euros. Therefore, the perceived image of G-Star is not that of a fast-fashion brand but more of a luxury product that we will be keeping for several years.

To summarize, the brand is in a differentiation perspective and seeks to innovate its products both in the design and in their manufacture. The competitive advantage of differentiation based on transparency and sustainability is a strategy against the world of fast fashion. However, by analyzing the supply chain, we can see that the company is not in perfect harmony with sustainability and wants to improve further. The supply system is also international with low-cost suppliers. Therefore, it is difficult to categorize the brand as a luxury product. We can hypothesize that as the brand is relatively young, it could continue this phase of transition and become a very tough opponent to match up with others.

5.4 Is it possible for G Start to change its production?

From the analysis of the G-star case, we have seen that the company puts at the center of its production policy a system tending towards a sustainable model. The efforts provided by the company are quite consequent and place it in a good position concerning the problems linked to the Jeans sector and more generally to the textile industry. What about the future of the company? The question we can raise "Can G-star do better and how?"

The business model of the company is international and works in B to B with Jean's producers. Therefore, one of the biggest disadvantages of this model is the **lack of influence on management and production policies**. On the other hand, this model is also naturally accompanied by negative externalities linked to the globalization of the textile sector as stated in point 3. Even if the company pushes its suppliers to other conditions in its specifications and contracts, **it is only filling holes when other solutions exist**. For example, even if social and environmental issues are taken into consideration and reduced, they will always constitute an equality problem until the local conditions of the producing countries are in line with those of the so-called developed countries. In other words, if countries like India, Bangladesh, and China are chosen, **it is simply for cost reduction purposes**.

So concretely what can G-star do in the future to alleviate these persistent problems?

In the first instance, G-star can continue to improve its environmental and social performance by increasing the number of certifications and monitoring its suppliers. Obtaining new certifications, application of Cradle to Cradle, and recycled on a larger part of its range are part of the company's future aspirations.

As for the transparency of the supply chain, G-Star could opt for an extension of tier 1 and 2 suppliers to tier 3 and 4 but these risks are much too complicated and unclear. **The best solution would be to buy a part of the production to enter into trade with the beginning of the production chain**. But this will probably not be possible due to the amount of money for such acquisitions. This project could be more feasible in time with greater maturity of the company. Today the company has not communicated in this sense.

Finally, the economy of a reduced transport network seems almost not possible for a globalized system, and it is unthinkable to move from an industrial economic model to local craftsmanship.

It would be a too great financial risk and a distortion of the offer of the company which would lose a lot in production strength.

One of the solutions would be for the brand to create a network of suppliers from the beginning of the production to the end. From the collection of raw materials to the production of the garment, the different production sites should be located in neighboring countries or the same country. As for handicrafts, G-star could launch a range of luxury products or create **a third-party brand that could be based on a market niche** and that would put localism at the center of its interests.

6 Alternative model study case

We have seen through the analysis of the G-star case that the industrial/globalization model has improved over time. However, **this model is not fully appropriate for sustainable development** and only fills in concerns that can be avoided with the adoption of other more artisanal manufacturing methods. However, the transition can only be made on the side of industrialization and internationalization and not on the other at the risk of sinking the company. In this part, I will consider those who have chosen an alternative business model to the majority of the textile sector. Is this system feasible and has lasting effects on the negative externalities of the most common model?

6.1 What are these alternative models?

Some companies have put the rejection of industrialization at the heart of their values. They have used different models. I will detail some of them.

6.1.1 Pre-ordering and stock optimization.

The brand Asphalte created in France in 2016 has decided to operate solely through a system of its own. Among its values, we find a criticism of the fashion industry: "**The clothing industry has gone to hell**". The motivation of the creators was to reduce production costs as well as unnecessary stocks in stores and warehouses. So, they decided to create an advanced pre-order system that takes into account the expectations of consumers.

To do this, the company puts on its website a future product and people issue their demands on it. Then, the company creates the design of the product and looks for suppliers of raw materials. The product is then created and tested to be put on "**pre-order**" on their website. Consumers can book the product only when it is available. The number of products produced will be equal to the quantity of pre-ordered products. The system created is therefore governed by demand and not by supply; **it avoids unnecessary stocks.**

It should be noted that for this system to be effective, the company offers only a slightly customizable product. To fill this gap, the product is accompanied by a **description of the characteristics in the video** as well as the methods used to make it. For its denim which is named the ultimate Jeans, the company explains that this one is made by a very resistant Japanese company that has passed a battery of tests. They also made tests on the cut on different physics and called several stylists. In addition, we learn that their workshop is based in Portugal.

Among the other values of Asphalt, we find a return to the **old school design** and the inspiration for quality products that will have a longer life. The company is committed to offering consumers a product that will accompany them much longer than the competitor.

6.1.2 Life cycle extension

To curb the phenomenon of plastic and cotton waste, the Paul & Shark company is an example of a traditional Italian company that has taken the gamble to radically change its vision. The Italian brand drew its inspiration from the traditional maritime field of high fashion. Its transition began in 2012 when the company equipped itself with solar panels to provide 15% of the energy needed to run its factories. But where Paul & Shark **excels is in its use of raw materials**. The company has a huge number of certifications and sustainable projects that it proudly displays on its website:

- Save the Sea and Shark Trust project,
- Seaqual,
- Organic Cotton, Re cotton, Econyl, and Eco Wool,
- Second life,
- Guppyfriend Washing bag,
- E.M.W and Watershed,
- Goose Down,
- Plastic-free certificate,
- Iso 14001:2015,
- Sustainability Award.

The effort made by the company is considerable when it comes to materials and their reuse. Indeed, from plastic fibers to nylon and cotton, they all have a new life cycle that is at least doubled during production. The company is also **involved in ocean clean-up projects** in line with its origin and initial inspiration. The company's focus on sustainability and technology innovation makes the products it offers hard to beat. This diversification strategy has paid off as the company has been able to assert itself as **a luxury brand while offering recycled and high-fashion garments**.

In Belgium, the company HNST offers recomposed Jeans. Every year in September, the company collects old Jeans in partnership with second-hand stores. The process consists of the defragmentation of the too worn pieces which are then rewoven with Tencel to obtain the fiber used for the reconstruction. Two companies collaborate with the brand, ESG in Belgium for the reconstruction and SmartIndigo™ in Italy for the dyeing. Currently, the company assures that

its Jeans are composed **of 56% of old Jeans; the rest is composed of organic cotton and Tencel**. All new pieces are washed in Portugal. These Jeans are considered to be one of the most durable in the world and the company is still looking to improve its process. The price of these jeans can vary from **125 to 350 Euro**.

6.1.3 Localism

Although the brands mentioned above use short circuits by locating their operations in Europe, the definition of localism could be more appropriate for companies seeking to minimize transportation by using raw materials available regionally and by locating only in their country. From this perspective, we should be interested in raw materials such as cotton. Cotton is only grown in Europe to a very small extent, for example in Greece 80% and Spain 20%. We have also seen that cotton is not a good raw material for the environment. That's why we are going to rely more on ecologically responsible and available resources. Everything must be done in a short circuit restricted.

To illustrate this concept, two specific examples of the production of jeans will be discussed: the replacement of Cotton with another raw material and the exclusively local production.

The first example is a Jeans made **100% in France**. Sofiane Rahmani, a graphic designer decided to launch his brand Sobo in response to the industrialization and current supply chain characteristics of Jeans on the market.

His company is a startup financed by online fundraising. His Jeans made in France follow this path:

- Research and development in Strasbourg,
- Purchase of organic cotton in Nantes
- Design in Soultz,
- Weaving and dyeing in Saint Amarin,
- Haberdashery in Lyon,
- Production in Decines-Charieu.

Being himself a fan of fashion, he decided to go in that way keeping in mind to highlight the know-how of his country. For him, fashion can be done locally but **this model must become universal in the future**. After having faced difficulties at the beginning, he succeeded in creating a successful company and wants to offer his customers durable, local, and timeless Jeans. One of the main missions of the company is **to push the consumers to make more reasonable choices** and to stop mass consumption. In addition to this choice of shortened circuits, the company uses recycled cotton and vegetable coloring for the creation of its denim.

Finally, many companies are promoting hemp as an alternative to cotton. Available locally, it avoids the transportation of this raw material which is only rarely cultivated in Europe, and it is less demanding in pesticides and water. Brands, like Hempage and the Atelier Tuffery, offer Jeans with a composition of **50 to 100% hemp for their product range**. The use of linen can also be considered a more sustainable alternative to cotton, but its production and origin are further away.

6.2 Why they choose it?

The different companies mentioned have one thing in common: breaking the codes of large industrial companies by offering sustainable products. For some of them, they were established only recently, others are old family businesses that have developed and wanted to take this direction like Paul & Shark.

But the bottom line is that today, in Europe, to create a business around Jeans, you need a lot of liquidity for the tools and the price of labor is also much higher than in the main producing countries. One of the reasons why more local companies get involved in sustainable development is the financial disadvantage that globalization imposes on them. Moreover, **the competition is already very present**. So, to stand out, these companies will look for an asset that will characterize their brand. Others also play on emotions and **the return of the know-how of the powerful but past European era**. Others on the tradition and the knowledge of the old ones. Anyway, their choice is conditioned by the research of customers.

Even if the main reason is related to the creation of competitive advantage of differentiation, we have seen that through the cases, the decision to invest in practice cannot be done without real convictions that are difficult to put in place.

6.3 Is it profitable?

One of the main reasons why it is difficult to create a sustainable trade in the European area is the price of labor. Any European countries, even if there are differences between them, are more expensive in labor than Asian or African countries. The second reason that could discourage an entrepreneur or an investor, is **the legislation when it comes to labor law**, days off, and labor protection obligations that are once again higher in Europe than in those countries that produce the most. The last thing is the corporate tax and the difference in prices of suppliers.

This is why most of the large companies are turning to relocate their production in order to reduce their costs. Moreover, we have mentioned the barriers to entry that consist of the

equipment as well as the monopoly of large companies anchored in the collective consent of the company.

From now on, the companies that are going to make sustainable products will have to play on these aspects to be able to become profitable and to find a consumer base. In the cases analyzed, the price is higher than the competitors; this can be explained to the consumers via the efforts made in terms of diversification and sustainable development. Therefore, the targeted consumers are restricted to

- Those who have an affinity with the company's projects,
- Those who are ready to put more money in a pair of Jeans,
- Those who have been warned of the existence of the company.

7 What is the best offer on the market?

7.1 Creation of a jean's matrix of sustainability

Now that we have seen different production models with their advantages and disadvantages, a comparative matrix of these components will be drawn up for 4 products available on the Belgian market. Two products will be based on a standardized industrial economic model and two others will be linked to more sustainable alternatives. The question here is: **which product is the best according to the criteria defined by the preferences of the Belgian consumers?** These different criteria are the following and will be graded by performance from one to five.

- Price,
- Quality,
- Design,
- Environmental friendliness,
- Respect for the workers,
- The length of the supply cycle.

7.2 Make a ranking with a matrix

LEVI'S® WELLTHREAD™ 502™

At the end of 2020, Levi's has partnered with Swedish brand Circulose for a unique denim recycling. Its new 502 model benefits from this technology and is composed of **50% recycled denim fiber** to which this vegetable substance has been added. It is considered by the brand to be the most durable of its collection.

Price: The jeans cost 120 euro in Belgium which is above average but still affordable.

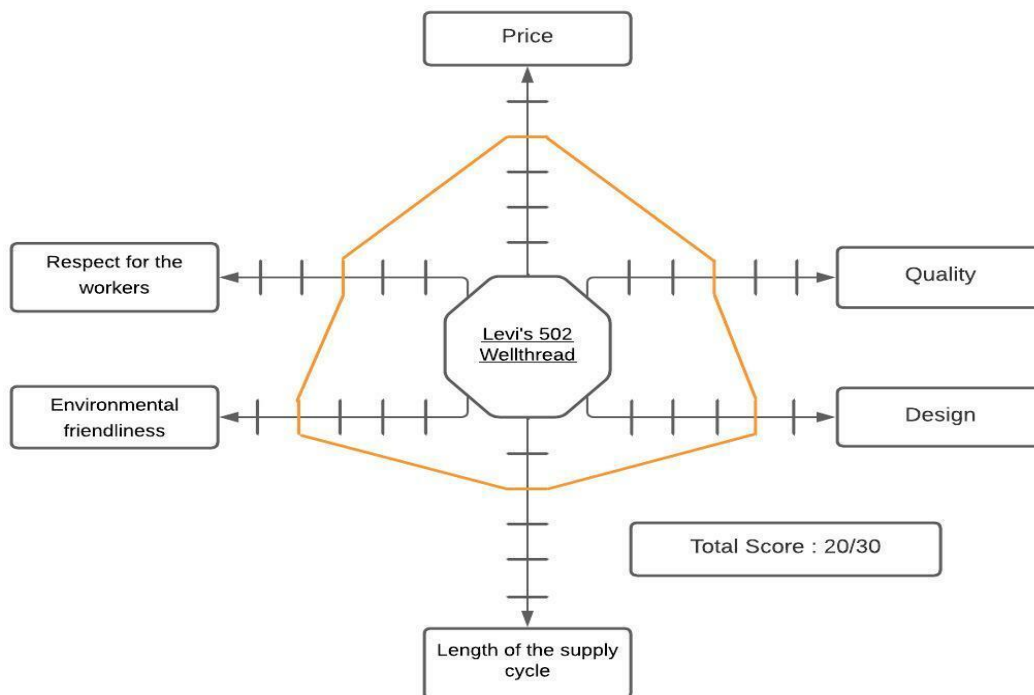
Quality: The recycled fibers present the same practical aspect as the denims, resistant but without more.

Design: it is identical to the traditional cut of Levi's, uncluttered and simple to please the greatest number of people. However, it is not elastic which may not properly follow the curve of the legs and may disturb the user.

Logistics and transportation during manufacturing: The Jeans are made in China and the recycled materials come from all over the world to be shipped to countries outside Europe.

Environmental friendliness: This initiative is very environmentally friendly as it does not use 100% new cotton and spares water and chemicals products.

Respect for the workers: Nothing is said about this in relation to the Jeans, but Levi's is committed to the defense of foreign workers through several projects. In addition, the non-use of chemicals in this process reduces the health risk factor.



This Jeans score 20 on the matrix and can be considered more durable than the majority of products on sale. For the moment. No feedback can be given on the quality and there is no information on where the recycled fiber is made. It is quite versatile and not overpriced. The target of this product can be young people who do not have a lot of money for sustainable development and who wish to commit themselves to the environmental problems due to the intensive cultivation of cotton and clothing waste. It can also be suitable for anyone who has an affinity with this cause, especially since the Levi's brand is intergenerational.

5620 G-STAR ELWOOD

G-star launches every year a new version of its 1996 model ELWOOD 5620. This product has the particularity to stand out from the others in terms of requirements and certifications that are not applicable to the whole brand. This product is certified, **cradle to cradle, zero detox and the cotton used to 91% in the product is from the Better Cotton initiative** which allows small farmers to develop and form cooperatives. The rest of the components are recycled synthetic fibers.

Price: The Jeans are available in Belgium for the sum of 170 euro. It's the double of what a Belgian consumer used to spend on average for a Jeans.

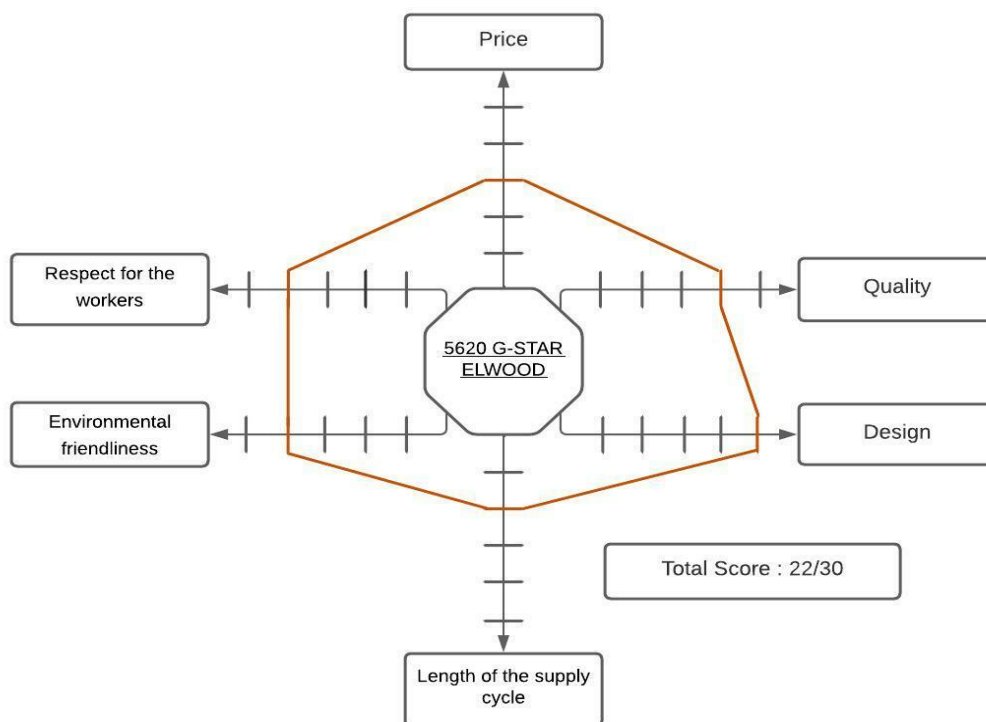
Quality: The Jeans has a Cradle-to-Cradle Gold certified gold. The fabric is also reinforced by a complex seam overlapped in different parts which create several layers at the knees.

Design: The company uses powdered 3D cutting technology. This Jeans has been designed to be unique with a biker style. It is unique on the market. It also has a mix of fibers that makes the Jeans fitting well the body and does not gene the movements.

Logistics and transportation during manufacturing: The company does not communicate on the particular provenance of this products, but G-Star generally deals with Asian countries like Bangladesh and India. Moreover, nothing is said about the provenance of the different synthetic fibers used for elasticity.

Environmental friendliness: All the certifications of this Jeans make it possible to say that they are well beyond the standards with regard to the environment. The company took care to have all its components certified.

Respect for the workers: Cradle to Cradle certifications as stated in the product description allow the ELWOOD model to be correctly classified. However, this certification does not include the living wage of the chain's producers. The enterprise draws a profit from the employment of workers of the third world and is always in progress when to the social achievements of these people.



The model got 22 points on the matrix. G-star is a promising young company and has the willingness to improve in the future. There are still some points to be reviewed concerning the wages of foreign workers. These Jeans are suitable for people in style and comfort with materials respectful of the environment but remain too expensive for people who do not have the possibility to buy them.

Asphalte, le Jeans ultime

The company Asphalt launched a unique Jeans in August 2021. The selling point of the company is to make a product according to its future customers. **The qualities taken into account are robustness, style, durability, and the fit that fits the body.**

Price: The Jean is on sale at 100 euros in pre-order. Which makes it the product of the month looking for this comparison. Unfortunately, it is delivered from France. Additional shipping costs will have to be added.

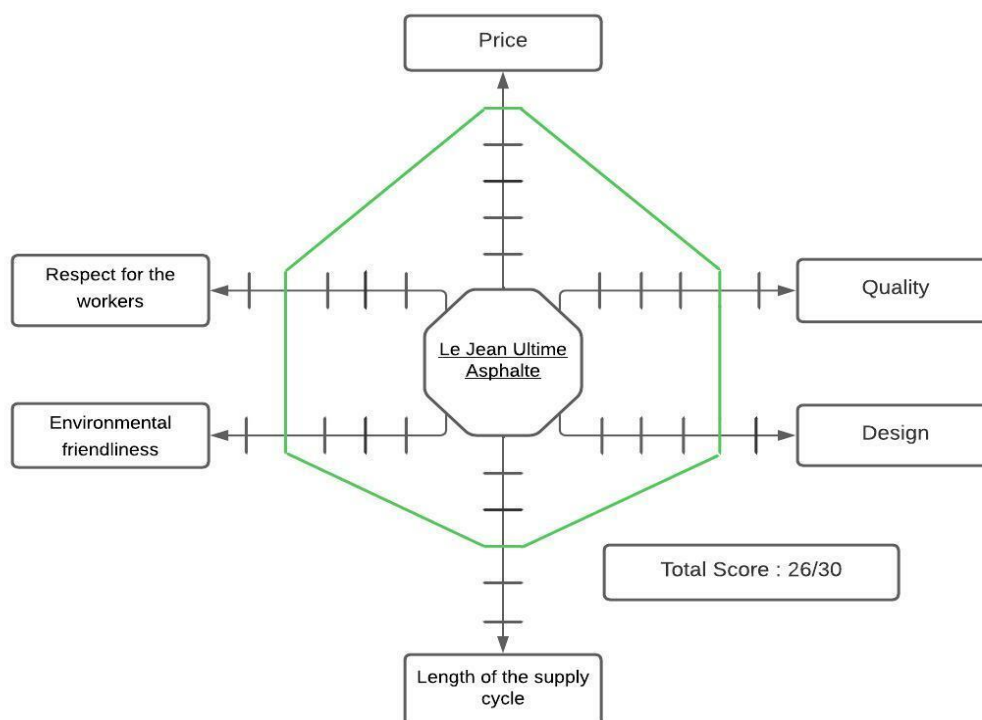
Quality: The fabric used is selvedge. It is originally from Japan and is recognized as a very high quality and robust material. In addition, tests have been carried out to evaluate its resistance and its capacity, wider than the average.

Design: It is made according to consumer feedback; the model is a semi-slim available in several colors. Quite simple and suitable for a large number of people with old school style.

Logistics and transportation during manufacturing: In addition to the fact that the canvas comes from Japan, all production stages are carried out into workshops in Portugal and in France.

Environmental friendliness: The purpose of the product is to create Jeans that last a long time. Even if the brand does not communicate directly on this aspect, the values and methods used as the made in Europe and the traditional Japanese web allows to classify this product as being more respectful of the environment.

Respect for the workers: The workers who are mobilized to make this Jeans are not subjected to risks of mistreatment, salary failure or health.



The rating is 26 points. These Jeans have many qualities and appeal to a meticulous and traditional technique. It is still not well known nowadays, but suitable for people who are attached to the longevity of their clothes and European know-how. The only problem with this product is the time it takes to get it. In general, the Asphalt products take 3 months to arrive once the order has been placed. Its price makes it an affordable quality item for a large portion of consumers.

Red Rivet stretch organic cotton Candiani Denim Jeans by Paul & Shark

The last denim that will be analyzed is the Candiani model of the Italian firm Paul & Shark. It is a luxury product that also has durable characteristics. **It is made of 98% Cotton and synthetic fibers (SPANDEX)⁶.** The company has a record of certification and sustainable projects on all its products and has followed a transition to a more environmentally friendly model.

Price: It is 210 Euro which makes it the most expensive Jeans among the proposals.

Quality: The company assures that its Jeans are of superior quality and that its color resists to the test of time. The fabric is made of organic and recycled cotton that was assembled in Portugal and finished in Italy.

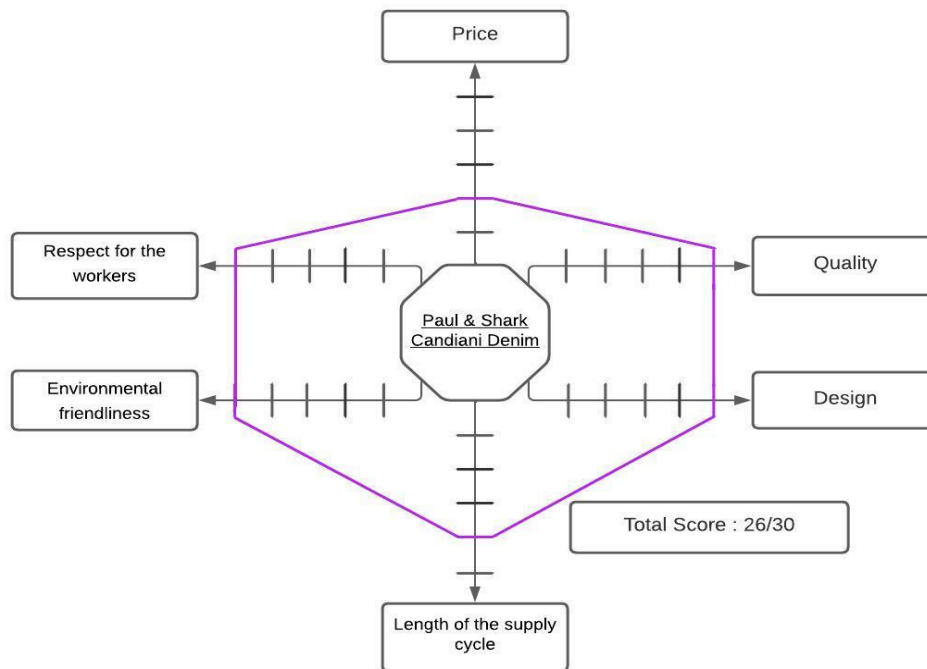
Design: The Jeans are cut to a regular fit. The synthetic fibers make the product comfortable and practical for everyday use. The brand reminders are on the back and front right pockets and are embroidered. Overall, it fits well on the legs and can be adapted to many body types.

Logistics and transportation during manufacturing: The Jeans are only made in Europe and the raw materials are either recovered and recycled in Europe or come from certified organic producers.

Environmental friendliness: All brand certifications put this product in a superior range of sustainable products. Indeed, the raw materials are largely recycled and come from ocean depollution initiatives. The washing of the Jeans is done with natural enzymes.

Respect for the workers: No worker involved in the production of the Jeans comes from a country at risk with regard to health or working conditions.

⁶ SPANDEX is an elastic fibre composed of over 85% polyurethane. There are several synonyms or fibres of the same type. Elastane, Lycra..



Paul & Shark scored 26 points on the matrix. This Denim offers qualities that are unequalled by the vast majority of its competitors. Its main strong points are its design, its quality, and its very sustainable aspect towards the de-pollution of the oceans and the reuse of raw materials. The problem with this product is its price which is 3 times higher than the Belgian average. Finally, the consumers who will buy this article will be probably people with higher financial means with a pronounced taste for the marine theme and with a sensitivity to the respect of the ocean.

8 Conclusion

In relation to the initial question of this research about the availability of sustainable alternatives on the Belgian jeans market, we can say that there are a multitude of sustainable Jeans with their own assets that would like to correspond to the affinities of consumers. We have also seen that there are two types of companies: the large-scale production companies and the smaller ones.

In each of these models, a sustainable alternative is possible but had to be submitted to a strategic risk analysis in the case of a transition on an industrial level. For European start-ups, access to sustainability remains difficult to implement, but it is a better choice for local and artisanal businesses to ensure a differentiating advantage. The Dhaka Bangladesh disaster, the various investigations, people involved, and not to mention the easy flow of information on social networks, have opened the eyes of the world about the issues related to the textile sector. From then on, the big companies felt forced to go in the direction of respecting the workers and the environment. In the future, we can hope that these negative effects will diminish. However, there are still several causes that could slow down this process.

One of the major problems that persists is the consumer awareness of brands that offer more sustainable products. On the other hand, with the emergence of social networks, the quantity of clothing purchased is still growing and unscrupulous brands are playing on this trend to sell poor quality products to an unsuspecting public. Indeed, the fact of getting dressed comes out of a very deep psychological lever anchored in the human nature. Clothing is a means of identification which could be a source of frustration and a basic need for recognition, as witnessed throughout history with its different modes and class affiliations. Today more than ever, people need to be part of a group and trends are changing so fast that the textile market responds to this demand.

The challenge for our generation will be to change consumption habits and to assert our role as active consumers. It would not be easy to break our addiction to a quantity of cheap and abundant products and to make more judicious choices that require more reflection.

Finally, one of the points that has not been addressed deeply in this thesis, but that is intimately related to the problem, is the influence of brands and social networks on people's behaviors. We have seen through the survey a large number of inconsistencies between values and sensitivities towards purchasing behavior.

One of the questions we could ask ourselves would be: "Is there an influence that pushes consumers to buy clothes that are not in line with their values."

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10 Appendix

Sensitivity of Belgians to advertising (Google Survey)

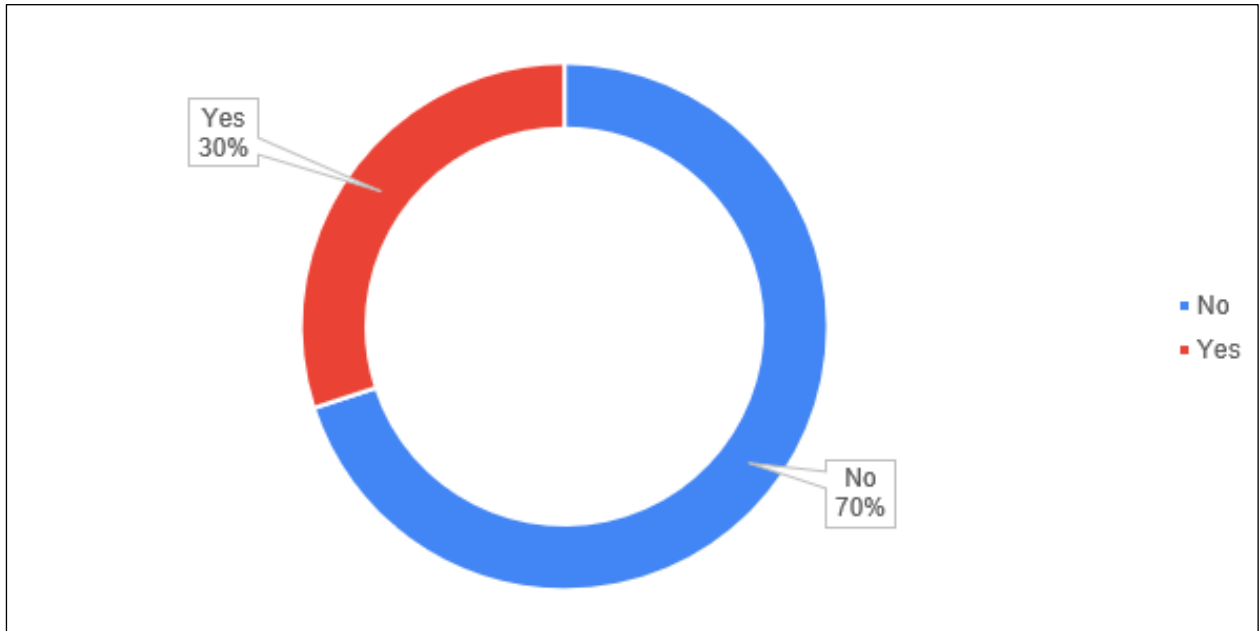


Figure 1

Proportion of Z who buy jeans to wear it only on social media couple of times (Google Survey)

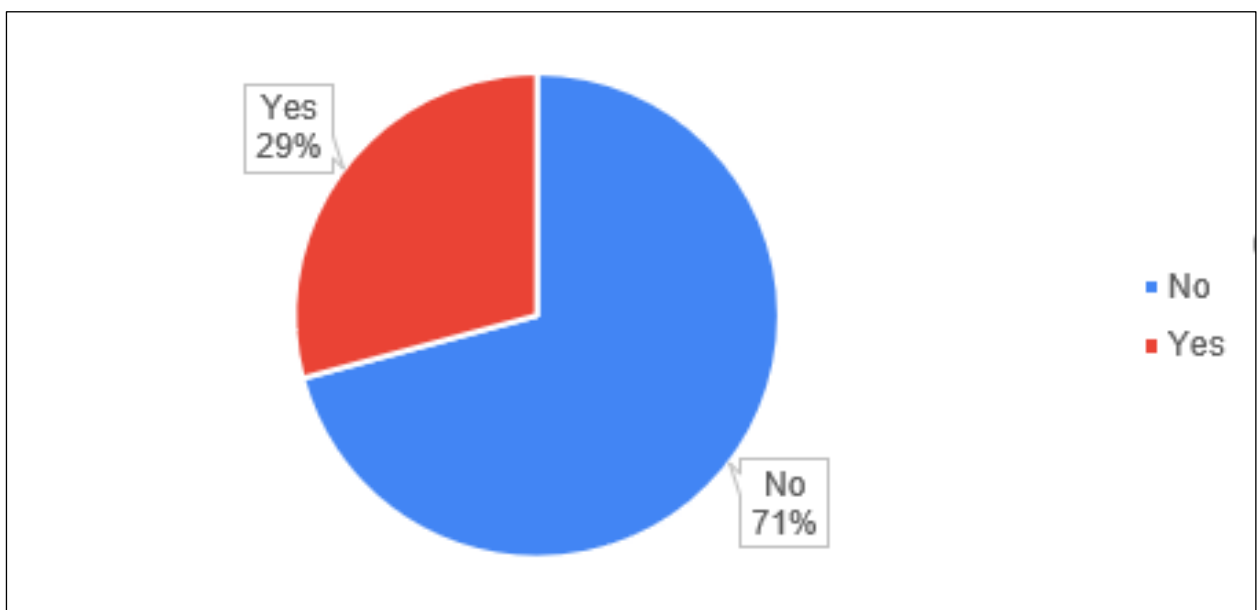


Figure 2

Frequency of jeans purchases for Belgian people (Google Survey)

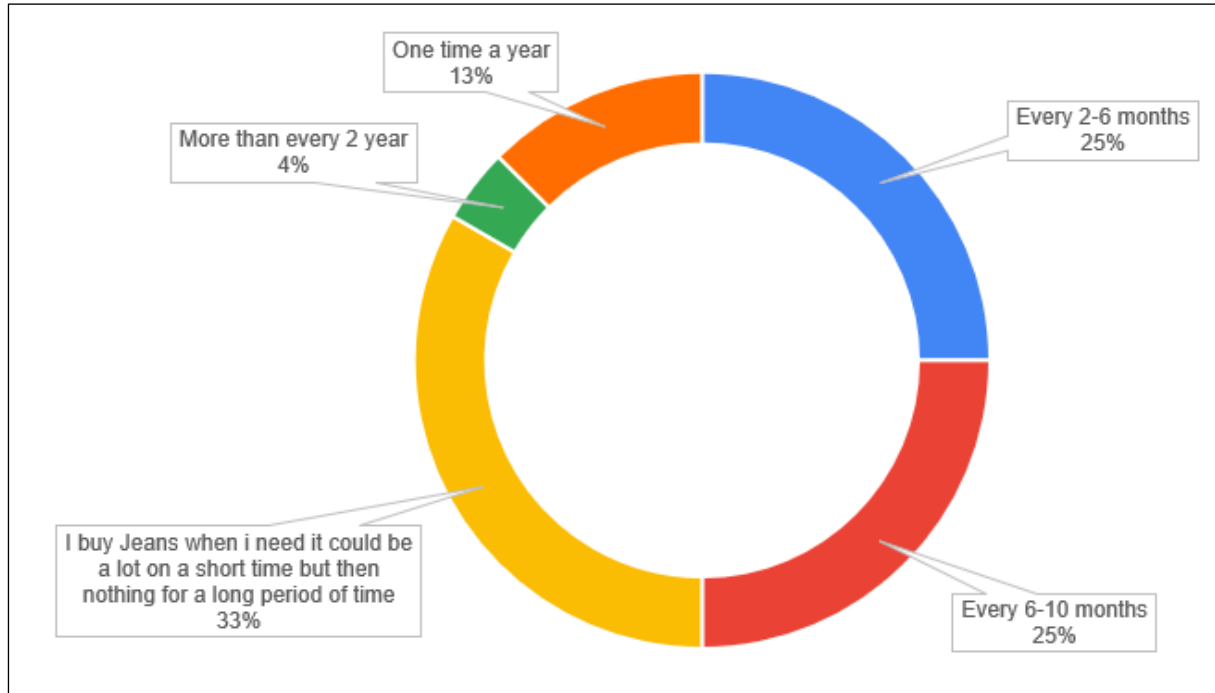


Figure 3

What do the Belgians do with end-of-life jeans (Google Survey)

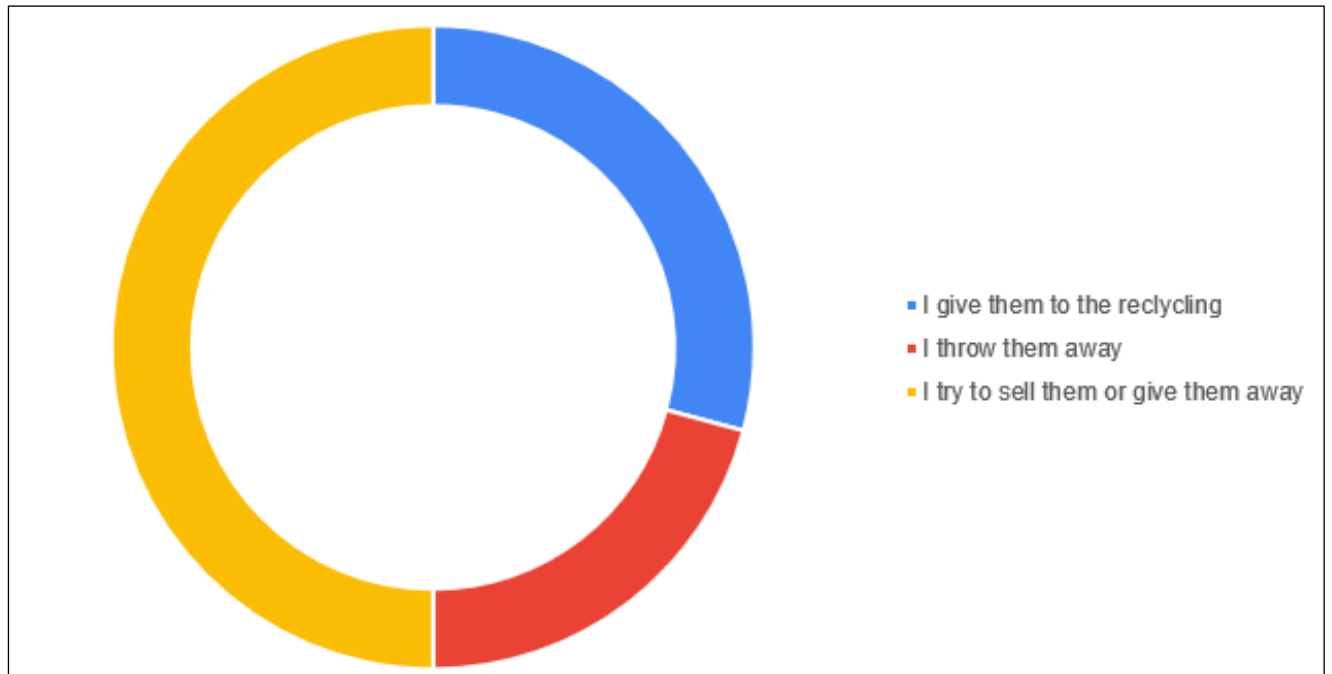


Figure 4

G-Star Raw Supplier Declaration

SUPPLIER DECLARATION

Compliance with the G-Star Supplier Code of Conduct

<Company name>, a company with its statutory seat at <company address> registered with the [Chamber of Commerce/ Companies House] of _____ under the number _____ hereby **duly** represented by _____, who declares and warrants that he/she is duly authorised to sign this Declaration, hereinafter "Supplier", commits to the following:

G-Star Supplier Code of Conduct

The G-Star Supplier Code of Conduct outlines G-Star's expectations regarding the conditions under which its products should be manufactured. It clarifies and elevates the expectations we have of suppliers we work with and lays down the minimum social and environmental standards we expect each factory to meet.

- The G-Star Code of Conduct contains:
- Social & environmental standards
- G-Star Materials Policy
- G-Star Restricted Substances List (RSL)
- G-Star Manufacturing Restricted Substance List (MRSL)
- RSL Testing Policy

The Supplier ensures that all G-Star products, fabrics and accessories will be produced in compliance with the prohibitions, restrictions and requirements described or referred to in the G-Star Supplier Code of Conduct (which contains the social and environmental standards for workers and the environment) as well as the G-Star Materials Policy, G-Star Restricted Substances List, G-Star Manufacturing Restricted Substance List, RSL Testing Policy and any additional requirements imposed by law/for (local) authorities.

The Supplier hereby acknowledges:

- the receipt and content of the G-Star Supplier Code of Conduct of April 2014, the therein included G-Star Materials Policy, G-Star Restricted Substances List, G-Star Manufacturing Restricted Substance List and RSL Testing Policy.
- the commitment to fully and unconditionally comply with the G-Star Supplier Code of Conduct including the G-Star Materials Policy, G-Star Restricted Substances List, G-Star Manufacturing Restricted Substance List and RSL Testing Policy, as well as any updates of these documents sent to the Supplier by G-Star from time to time; if compliance is not immediately possible, it shall immediately be brought to G-Star's attention and a corrective action plan, satisfactory to G-Star, shall be drafted in a time-frame discussed and agreed upon with G-Star.
- that G-Star reserves the right to suspend or terminate any business relationship with Supplier if the supplier fails to comply with the G-Star Code of Conduct, G-Star Materials policy, G-Star Restricted Substances List, G-Star Manufacturing Restricted Substance List and RSL Testing policy, as well if corrective action is not taken in the manner and time frame agreed upon with G-Star or if the parties are unable to reach an agreement on a corrective action plan and time frame satisfactory to G-Star.

Place & Date:

Signature:

Please send a signed copy by e-mail to CR@g-star.com

Figure 5