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Biosynthetic essay

The Fashion industry has tried to minimize the harm of producing clothing. Various ways of dyeing the fabric and the use of sustainable materials have been used to contribute to sustainable practices. By the use of natural dyes, it can contribute to a healthier approach to the industry but is more expensive. One of the companies utilizing natural dyes is Vege threads and Tonle. Vege threads is based in Australia and they assure that their brand utilizes limited batches and eco-friendly materials & dyes. Tonle assures that they practice zero waste, handcrafted, natural dyes, fair trade production, (the good trade, 2020). These brand's practices with using eco-friendly materials and dyes ensure that they are contributing to the health of the environment.

Natural dyes are considered to be free from chemicals that do not harm our skin or the environment. The second largest polluter is the synthetic textile dyeing industry. 10 to 15 percent of dyes are thrown into the ocean and rivers. Brands with the intention of promoting sustainability will avoid dyes and only make clothes that are beige, grey, and white. In the mid 19th century synthetic dyes were known and it revolutionize the industry because of how fast the process was and the wide range of colors. Also, the majority of natural plants have health and skin benefits. On the other hand, the chemical process damages nature, rivers, and pollutes the ocean. This water is also unhealthy to the consumers and workers (Mikkelsen, 2019). (Refer to figure 2).

First, Vege Threads utilizes a non-toxic solvent, and the cotton garments are created from 100% certified Global Organic Textile Standard (GOTS). Their line of sustainability includes eco-friendly fashion for men's and women's basics, and also women's activewear and swimwear. They do not include wool, angora, or fur. They also have a great rating on how they treat their employees. Vege Threads has the desire to be a transparent business, and stand for sustainability, fairness, vegan, gender equality, and by supporting local knitting mills, and dye houses. They utilize a brand that is an accredited ethical Australian brand. For their brand, they use accredited dyes from GOTS(Global Organic Textile Standard. The GOTS is a global textile leading company ensuring the use of organic fibre (Global standard, 2020). Vege threads seem to be transparent. They are informing in their website and to the industry their approach to being a brand that is working to be part of the solution and not the problem (Vegethreads 2020).

On the other hand, In 2008 doing research as a Fullbright scholar, the owner of Tonse, Rachel Faller sought to investigate fair trade and sustainability in Cambodia. Tonle was created in 2013. Tonle supports handcrafted and fair trade production. For their brand, they also use natural dyes and zero waste practices. Based in San Francisco, they are a womenswear brand. They are made completely from overproduced fabric that is discarded by the Cambodian apparel manufacturers. They are determined to not waste any piece of fabric. Their motto (?) “Every thread matters”. For the pieces of fabric that they cannot turn into a piece of clothing, they will either make it into a strip or make it into yarn. In the fashion industry, the waste in factories is about 40 percent; When working to ensure sustainability is about 2 to 3 percent waste according to Faller. Tonse works with pre-consumer textile waste: deadstock, quality control failures, and scraps (Fashion United 2020).

Furthermore, Both companies are playing their part in the industry. They are both utilizing sustainable approaches to ensure a healthier industry. Vege threads and Tonse are working with local factories and mills as well. They are pro helping garment workers be treated fairly. In the brand, Tonse, as Fuller made her research she found that in Cambodia workers are paid \$55.00 dollars a month. In addition, both brands have also worked to expand their brand internationally. For Tonse their network has 150 partners. These partners are in Japan, New Zealand, The US, Europe, South Africa, and Australia. “ but the brand is aiming for more. 2018 saw a 30 percent growth for the zero-waste label and Fuller expects even better results in 2019”(Fashion United 2020. Tonse also has stated because there are so many brands practicing sustainability it has been more difficult for the brand as well.

In the video “In Search of Forgotten Colours - Sachio Yoshioka and the Art of Natural Dyeing” They obtain the colors from plants. Originally Yoshioka’s family business used synthetic dyes but in 1988 he switched to natural dyes. They obtained the natural dyes from flowers, bark, berries, roots, and leaves. Yoshioka’s desire is to bring to life the use of vegetable dyes techniques used in the 19th century. Safflower petals are used to create the color red. It is harvested in the summer and dried out in the winter. The process is to soak the safflower petals overnight, squeezed, strained, and removed. Afterward, the dye turns yellow then the petals are washed to eliminate the yellow color, and later in an alkaline solution, the petals are soaked for two hours to extract the red dye. (Refer to figure 3)

San Francisco-based biotech firm company, Tinctorium, uses bioengineered organisms. They are using bacteria since they multiply at a fast pace to create dye products also contributing to sustainability. “ France's Pili, for example, states that its microbial fermentation process can save 100 tonnes of petroleum and 10 tonnes of toxic chemicals per tonne of product” (BBC news 2020). By using bacteria it will tremendously reduce the use of water to up to five times less and energy is also reduced ten times less. It is reduced because microbes function at room temperature. Another company created due to the scenery is Colorifix. After observing that after textile dyeing the leftover water would be dumped in the river; Colorifix to produce color would take the cells of a parrots feather and remove cells from the tail. They make the pigment from the micro-organism and it can make for example a red pigment the same way the parrot does, by using sugar and nitrogen (BBC News 2020).

From the article “*Do you have it in green? The living fabrics that can help clean the air*”, The recent strategy is clothing made of algae by using carbon that can absorb carbon dioxide from the air; this is called “ *Carbon-negative clothing*”. The creator of Carbon-negative clothing is Post Carbon lab. Their attempt is to utilize photosynthesis coding. This is the process of obtaining a coating of a living algae and place it on the fabric. Afterwards, it will absorb carbon dioxide producing oxygen, and converting the carbon into sugar. This is also another attempt to not harm the environment. The purpose is to obtain an alternative material that has a smaller carbon footprint. With the use of algae in clothing, certain factors need to be taken into considerations. A few precautions is that the algae clothing needs to be placed in a ventilated area. The products need light and carbon dioxide (Tapper 2020).

On the other hand, various textiles made from natural ingredients include pineapple leaves, mushrooms, and Cactus. For example, “Piñatex” textiles are made from pineapple leaves. They are used by big brands like H&M, Hugo Boss as well as Mycotex. Mycotex is another substance and it is grown from mushrooms. Also, the use of Cactus is the newest plant-based strategy to make leather from leaves. Studies estimate that the global textile production produces alone 1.2 billion tonnes of carbon dioxide a year. In addition, every year about 300,000 tonnes of clothes are thrown into landfill each year, that is in the UK alone (Tapper 2020). The fashion industry worldwide faces strenuous challenges because of everything that it entails in the creation of products. However, many challenges are also being targeted to be able to contribute to a solution.

In the article *“Orange Fiber: how to turn citrus waste into a sustainable fabric”* it describes that the orange fiber is made out of discarded oranges that are pressed and processed. This is then made into a textile that is made of removing the cellulose from the fibers. By utilizing nanotechnology this process is able to be achieved. It was created by two girls in Sicily Italy with the efforts to contribute to an environmental solution. An estimate of 700,000 of citrus are wasted. The use of nanotechnology technique creates a citrus fruit essential oil. Afterwards, this process it will create a vitaminic textile that hydrates the skin as well. (Refer to figure 1).

In conclusion, the fashion industry has made several attempts to contribute to the health of the environment. Fashion brands are trying to be sustainable and be ethical. On the other hand, The use of natural dyes are derived from nature and it creates less harm to the environment. There are various benefits with the use of natural dyes is that their is no harm nor to the environment or our skin . Furthermore, synthetic dyes are produced at a faster pace and their is a wider range of colors yet it is a risk for the health by damaging also the aquatic life. It ruins the soils and poisons the drinking water. The sustainable approach in the industry targets millenials because they seem to care more about ethical practices. A report revealed that 52% of consumers want the fashion industry to continue to involve sustainable practices, 29% of consumers would pay for sustainably-made products. (Moore 2019).



Figure 1



Figure 2



Figure 3

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