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MORALITY BEFORE KNOWLEDGE

Sustainable consumption and production in the clothes industry to reduce the effect of climate change

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ABSTRACT
Background: Climate change is undoubtly can not be resisted. The impacts of climate change are becoming more and more evident in front of our eyes, with increasing hydrological disasters. On the one hand, fashion is one of the largest contributors to carbon emissions in the world, especially after the fast fashion trend. Therefore, further study how to make fashion more sustainable should be done and implemented. By thus, in this journal want to answering the question what should the production side act to be more sustainable in produce textile & clothes regarding to reduce effect of climate change and from the consumers perspective side, how the consumers contribute regarding to reduce bad effect of fashion for climate. **Methods:** By using descriptive qualitative method in the form of collecting and compiling the results of the literature, analyzing the results of the literature, and interpreting the results of the literature based on topic relating to the title of the article. **Findings:** The result was some kind changing in the production side should be done such as, changing used electricity,used of dye, altered the material and made circular fashion industry, and for consumer there are some alternative thing that could be done such as buy ethical brand, buy second hand, and shopping less. **Conclusion:** By this reseach finding, so hopefully for further act should be done by collaboration between all key player toward fashion industry.

KEYWORDS: carbon footprint; climate change; fashion industry; fast fashion; sustainable fashion.

1. Introduction

Humans is a major factor that encourages the earth to a warm the faster than ever day before. Since the pre-industrial era, the carbon emissions that are released by human activity become higher and higher. Carbon emission like Carbon dioxide, carbon monoxide, methane, and other chemical gas compounds that can make heat trapped under the atmosphere layer, can be called greenhouse gasses. So these greenhouse gasses make the earth warmer since the amount of that gasses increases significantly (Osmanski, 2020). A warming of the earth caused by the incapability to release heat out of the atmosphere is called global warming. And the global warming causes the climate to change (Trenberth, 2018).

The impact of climate change can be very dangerous, especially for human survival. One of the impacts caused by climate change is food scarcity which can lead to starvation in some resilient countries. It is caused by some plants which can not survive even with only slight temperature changes. it happens especially in some food base plants like maize,

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rice, and beans (Jackson et al., 2021). Another effect of climate change in terms of human health is rising vulnerability toward epidemic risks like dengue fever (Sorensen et al., 2018).

By the forcase, The impact of climate change related to the economy in one of country can touch the tipping point, so, it can ruin all economic sectors. due to more huge infrastructure damage caused by extreme natural disaster events such as tropical storms (Auffhammer, 2018).

Even though the effect of climate change already touched under urgent level the demand of industry to fulfill human needs still going to increase. So, that means the carbon emission as the side material of production still going to be expelled. In the fashion industry it event worsened since the emerging fast fashion era (Joshi & Athalye, 2021).

When we talk about fashion, we can not be separated from the clothing and textile industry. Even since prehistory, humans can not be separated from clothes. Humans need clothes as a shelter from cool and warm temperatures surrounding, them clothess also protect humans' skin from insect bites when hunting for food. Along with the development of human civilization, now, clothes are not only a primary human need that protects the human body but also become a symbol of social status. But back then almost all humans still need to wear clothes (Kodžoman, 2019).

Talk about fast fashion, actually fast fashion emerge along with the modernization of the consumptive human lifestyles. Modernization is a concept of public openness to new things from the future, and modernity itself can be associated with the growth of capitalism or a credo that focuses on capital ownership. From there emerges the temptation of advertisements to encourage people to be consumptive (Shinta, 2018).

Through fast fashion, Hire fashion brands tend to think about how they can make a huge profit by changing patterns of production, they produce the clothes fast, cheap and “disposable”. But the cheap cost of clothes is came along with sacrificing the cost of the environment (Jacometti, 2019).

Until now fashion and textile is one of the biggest profitable industry around the word, that because that touch every all walks of life. according Joint economic committee, united stated congress, fashion industry is 1,5 billion USD industry worldwide.

In Indonesia, based on Ministry of Industry of the Republic Indonesia Several provinces are also centers of the textile industry, especially in the Central Java area. Regarding BPS (statistical center match) in the 2019 fashion industry growth about 29% annually. And the annual highest export of textile industry reach 8,2 million USD (Kemenperin RI, 2019).

Actually on textile industry, Textile industry is rank the second the most polluting industry in the word, and it can be more higher if we compaire the pollution green house gas emisiion that realiese by maritime shipping combine with international flight industry. It green house gasses that realise by fashion industy account approximately 1.2 billion tons. And In 2050 it predict the fashion industry will spend up to 25% of carbon budged around the world (Chen et al., 2021)

When we talk about business, offcourse there are two major factor that influence the business, that is supply and demand. Which supply come from perspective of production and demand come from perspective consumption. because the main goal of the sustainability in this journal is want to address the effect of climate change, so, basicly this journal will mostly talk how we can reduce climate change in the field of fashion industry from production and consumption perspective.

2. Methods

The method used in writing this article is a descriptive qualitative method in the form of collecting and compiling the results of the literature, analyzing the results of the literature, and interpreting the results of the literature based on topic relating to the title of the article.

The literature search was carried out in early November 2021 to early Sunday January 2022 through the Scopus, Hinduwi, Research Gate, and Sinta sites. And scope of the resources literature is comfrom article who published after 2018.

These entries were then screened for relevance, first only see the title and type of publication, then also read the abstract, and finally read the complete paper. This descriptive qualitative method is presented in the form of an explanation of the problems from the article

3. Results and Discussion

3.1 Production

In the fashion industry, there are several stages until one piece of clothing arrives in your closet. Broadly speaking, the chain of clothing production processes can be categorized into raw material extraction, industrial fiber, clothing industry, logistics and use, after use.

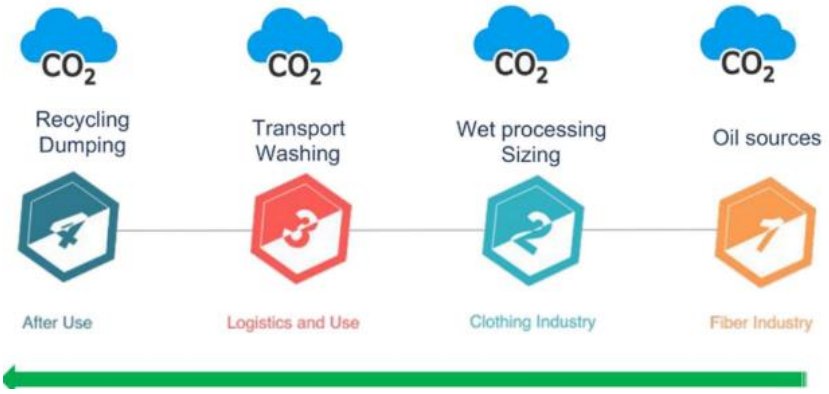
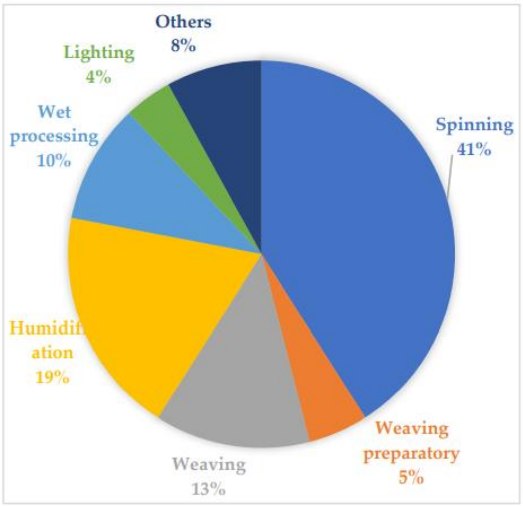


Fig 1. Chain of the clothing industry

Here is the chart that shows the percentage of electricity usage in some sectors of textile industry:

a



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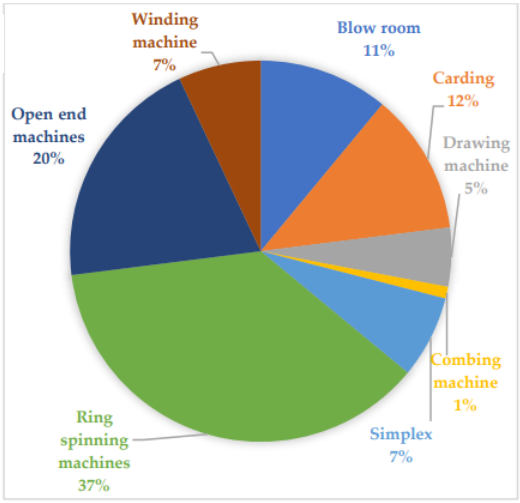

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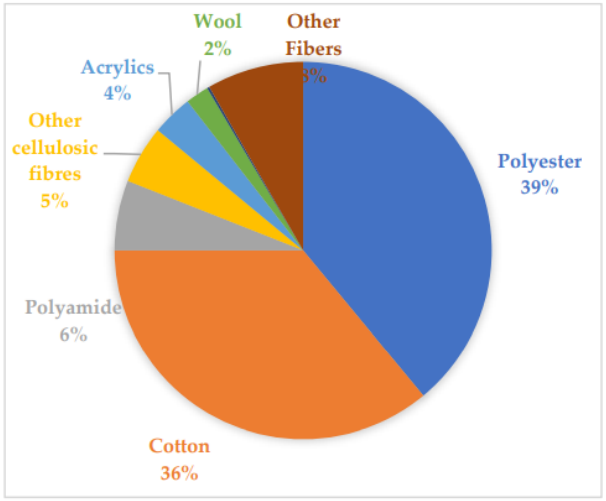

Fig 2. (a) Sector electrical energy consumption (b) Machine electrical energy consumption (c) Fibre consumption
(Joshi & Athalye, 2021)

Based on the data, from the production side, to reduce carbon emissions, here are several alternatives to do:

3.1.1 Altering the energy sources and managing the energy efficiency

On the chain making your clothes, it requires a high amount of energy on processes. The energy that will release carbon emissions mostly comes from fiber industry, clothing industry, logistics and after used. It due to in this process require electricity, and as the basic electricity energy come from fossil fuel, of course the greenhouse gasses from burning fossil fuel will be realeased. And it become the main source of the carbon footprint (Ritchie et al., 2020).

So, by knowing how much and where exactly the most consumed of electricity it will help us to trace and than we can reduce the amount of electricity consumption. The area in the clothing industry that consume high electricity are for controlling temperature, cooling, driving machinery, office equipment and lighting (Joshi, 2021).

To be more cleaner in production, it is so important to make energy consumption efficient.

Another thing is by using solar water heating and hear energy recycling as altering fossil fuel-based energy to green energy. Is one of the alternative to increase energy efficiency so that mean it also can reduce the carbon emission.

Basically green energy is come from sources like wind energy, solar, or event water. by installing solar panels on the factory roof of factory or installing windmills or building a dam and using the water flow to Harness electricity, or even use biomass energy it also has another advantage, because it more cheaper since the development of technology already increased (Akter et al., 2019).

3.1.2 Altering material of fiber

There are several kind of fiber, an basic classification based on the raw material, faber can be clasfied into Natural Fider and Artificial or man-made fiber. Natural Fiber Include wool, catton and another cellulose based material. And artificial fiber include polyester,polymade, acricil etc.

Basic material of syntetic fiber is comefrom fossil fuel, so the carbon emisiion will be significantly higher than fiber come from natural based material. Another thing is because

the artificial fober processing realease the by product like Nitrogen Dioxide that 300 higher the effect to harming the ozon layer.

After use stage of artificial fiber also will contribute to realise green house gas emisiion. It because when the product that come from this fiber dipose not properly,it alsow will realease carbon emission, even when recycling this fiber, the process is quite expensive and thos still realise pollution for the processing.

In the stage of dyeng process, sintetic faber still reales high amount of carbon emission (Ramasamy & Subramanian, 2021). And vice versa, when comparing with natural fiber natural faber will more lower emission since the based product is made by nature (Guo et al., 2021).

So, by altering the usage of sintetifiber to natural fiber that will be reduce the carbon emission.

3.1.3 Altering the use of dye

This is one of the more difficult problems to solve. It because the manufacture of the dye has no sgnificant contribution to realease a high amount of carbon footprint.instead the application of dye on the fabric that used high amount of energy. Actually every kind of dye has application method differently. Mostly the green house gas emission release at the end of dye pocessiong. For example, dyes whose process is quickly absorbed by the fabric fibers will wear off quickly, so to produce color fabrics that have a longer durability, higher temperatures are required, which means that more carbon emissions will be released.

So, for the solution is to obtain a dye that is not too fast, but also not too difficult to absorb, thus requiring relatively less energy with a long lasting color. and the carbon emissions that realease in this processes will be less.

3.1.4 Making circular fashion by recycle of damage clothes, or sell again as thrifted.

As the growing of fast fashion industry, which makes fashion produced quickly with models that change quickly, makes people consume fashion excessively, they tend to buy clothes that are only used once, because the model feels outdated. Clothes that are considered outdated eventually become clothing waste which of course can produce carbon emissions and microplastic issues, therefore there is a need for a fashion industry that applies circular fashion, (Moorhouse, 2020) by accepting clothes that are no longer worn by consumers. These clothes will later be resold as trifted products, especially for clothes that are still in good condition, while clothes that are not fit for use can be reprocessed into recycled goods.

3.2 Consumption

Consumers play an important role in the business, because consumers determine whether the business will run or not (brand sold or not). Thus, in achieving sustainability in the fashion business, it is necessary to have consumer actions that support it.

Hire are the way that consumers can do related to sustainable fashion to reduce the carbon footprint that has an impact on climate change :

3.2.1 Buy ethical clothing brand

Several manufacturers already moved towards sustainable fashion, throughout the garment life cycle it become more environmental friendly and low carbon footprint. One of the example the company that already moved toward sustainable fashion is Wal-Mart,actually walmart has been selling women's t-shirts used by organic cotton since 2004 (Speranskaya et al., 2018).

3.2.2 Buy second-handed clothes

With the fast fashion culture, there are also more clothes that are not used, which means that the energy of making clothes is only wasted to make clothes that are only worn a few times. By buying second-handed clothes, consumers have contributed to reducing carbon emissions as much as the energy used to make new clothes.

3.2.3 Shopping Less

By shopping less, that not only save the money, but also it reuse the waste and reduce the production, so that mean the usage of energy for making the product be reduced.

4. Conclusions

Climate change is undoubtly can not be resisted. The impacts of climate change are becoming more and more evident in front of our eyes, with increasing hydrological disasters. On the one hand, fashion is one of the largest contributors to carbon emissions in the world so, that must be an action that all stekholder should be collaborate. And all of them can not be sparated each other.

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