A Treadmill or Ecological Modernization?
A Socioecological Analysis of Sustainability in Fashion Industry

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469430

in partial fulfillment of the requirements for obtaining the degree of
MASTER OF ARTS IN DEVELOPMENT STUDIES

Major:

Agrarian, Food and Environment Studies

AFES

Specialization: Sustainable Development

Members of the Examining Committee:

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Content

Abstract

In this paper, the core research question"to what extent fashion industry can be sustainable" framed and reasoned based on three sub-questions: 1) How to define "sustainability" in the sector of fast fashion industry? 2) What are the institutional factors that intensify expansion of global fast fashion industry? 3) To what extent can "sustainable fashion" reverse the trend of fast fashion expansion? Two approaches of sustainable development, Treadmill of Production and Ecological Modernization are compared in their validity and applied as theoretical framework to analyze sustainable development in fashion industry with a political economic perspective.

By defining sustainability, an evaluation frame is expected to be established to assess the efficiency of each approach. Both treadmill of production and ecological modernization theories analyze the relation between modernity and environment but differs from each other in several aspects like institutional structure: industrial production vs. capitalism; major driving force: economic growth vs. technological development; predicted effectiveness of ecological preservation etc. Combined with the characteristics of fashion industry and contemporary political economic condition, the analysis on fashion industry is re-framed in the paper.

The analysis is focused on two key sustainable attempts in fashion industry: sustainable innovation in fast fashion industry and emergence of sustainable fashion brands. The analysis structure is based on the assumption that emergence of sustainable fashion is an innovative attempt under fast fashion system instead of a replacement of fast fashion. The conclusion is that fashion industry demonstrates more inclination to be an accumulated treadmill in terms of the dominant fast fashion production pattern and incomparable power of few fast fashion multinational corporations. Also, the fact that "sustainable fashion" is a business strategy instead of an environmentalism implementation means that sustainable fashion brands are not all committed to sustainability as they claimed. But we can not simply draw a conclusion that fashion industry perfectly exemplifies treadmill of production because whether the outcome of environmental degradation and natural resource extraction is not certain. More importantly, being environmental damaging and intensive in natural resource extraction is not the only standard to assess sustainability, but more about whether economic growth can pay off environmental and social costs and whether the sustainability achieved can sustain, or at least not sacrifice the next generation.

Key Words: Ecological Modernization; Fashion Industry; Sustainability; Treadmill of Production.

1. Introduction

For many people, fashion means new trends from runway to our daily life that most people want to pursue. Fashion industry as a whole is a business empire that defines trend and makes tremendous profits. According to statistics released by Fashion United in 2015, value of the global fashion industry reached 3 trillion, contributing 2 % to the world's Gross Domestic Percentage (GDP). It would be the world's seventh largest economy based on the ranking of individualistic country's GDP alone (Imran A., et. al, The State of Fashion).

Fundamentally being an economic endeavor, fashion industry bears its uniqueness in its duality that is also characterized as an artistic activity. In fashion industry, materials like cotton, silk or polyester are transformed into pieces with logo, brands, certain shapes that also contain creativity, aesthetics, cultural and social identity. (Godart, F., 2012:8). Fashion industry is not a static process but changes regularly and noncumulatively as a whole. Godart (2012:13-14) summarizes six principles that signify current fashion industry: 1) affirmation, the state that individuals and other social participants imitate each other and differentiate from each other; 2) convergence. It represents the geographical integration and immersing of various styles into few, regularly renewed trends; 3) autonomy. Autonomization from economy and politics as a creative endeavor; 4) personalization, which refers to the fact that products are more appealing to various preferences of individuals and more about designers; 5) symbolization. The attraction of brands and logos to customers that keeps the connection between customers and products; 6) imperialization. It implies the fact that few conglomerates in fashion industry dominating the political economy and social activities in supply chain.

Fast fashion as a "more affordable to more" fashion sector, is "based on the constant replacement of goods that do not need to be replaced" (Godart, F., 2012:2). Innovations in technology, transportation and production of raw materials compress timelines of production process and boost consumption as well as disposal. Take UK as an example, as the largest domestic market value of fashion in Europe (Fashion United), over 1 million tonnes of clothing was purchased in UK in 2016, while wastes generated from the supply chain amounted to 800,000 tonnes and 300,000 tonnes of them were dumped by consumers (Spary, S., 2018). Being highly water-consuming, toxic and bio-accumulative (Greenpeace International:33), fashion industry including apparel, texture, clothing, footwear manufacture and so on is the second largest polluting in the world following oil industry. The whole industry manifests remarkably high level of negligence of "exploitation of workforce, social well-being and drainage of the world's natural resources when it comes to garment production". Although sustainability and the exploration of the collaborative measures exerted by government and business was made a priority in fashion industry and gained wide popularity, it is still overshadowed by the mainstream concern of marketing and business management (Henninger, C. E., et. al., 2017:2).

Research objective of the paper lies in two layers: first, to develop a deductive argument by analyzing the development and transformations in fashion industry to argue whether it can be explained by the model of ecological modernization or treadmill of production; second, to assess to what extent alternative approaches of sustainable fashion can make fashion sustainable by analyzing its advantages and limitations. The research question to be argued and proved is "To

what extent the global fashion industry can be sustainable?" by answering three main sub-questions: How to define "sustainability" in the sector of fast fashion industry? What are the institutional factors that intensify expansion of global fast fashion industry? To what extent can "sustainable fashion" reverse the trend of fast fashion expansion?

Specifically, "fashion industry" we talk about in this paper refers to women's garment industry concerning its economic significance and prevalence. The analysis perspective will be concentrated on the production end instead of consumer end because the production process takes place under the system of capitalism and industrialism, which is a system of power and its distribution by nature. Consumers, as unorganized individuals, are far from powerful enough to challenge and to change the production and institution. But it does not mean that we completely ignore consumption perspective, it belongs to different study domain like social psychology, social behaviour so and forth.

Sustainability in fashion industry, in this paper, has multiple meanings of an industry trend, a marketing strategy and most importantly, a theoretical framework to analyze and assess relations of modernity and social-ecological cost in fashion industry. In a broad sense, sustainability means reproduce to meet the needs of the next generation and avoidance of extinction, discontinuities and disruptions both ecologically and economically (Costanza, R., & Patten, B. C., 1995:194). Sustainability as a theoretical framework is built on the triple principles of economic, environmental and social aspects, explicitly are 1) a growing rate and scale of economy based on the moderate use of it ecological support; 2) a relatively equal distribution of resources and opportunities among different stakeholders; and 3) "efficient allocation of resources that adequately accounts for natural capital" (ibis). Social-ecological analysis of sustainability in fashion industry is founded on this structure with theoretical approaches of ecological modernization and treadmill of production in this paper.

The paper is composed of six chapters. The first chapter indicates characteristics of fashion industry and how it is framed by sustainability. The second chapter introduces methodology and research methods applied in this paper and their limitations. Chapter three is literature review of two mainstream theories, treadmill of production and ecological modernization. Chapter four states the definition of sustainability as an analytical framework and analyzes the sustainable attempts in fashion industry, including sustainable innovation in fast fashion industry and sustainable brands as a newly-emerging attempt. Chapter five systematically analyzes sustainability in two sustainable attempts from a social-ecological perspective, structurally framed by the characteristics of fast fashion industry, power distribution in fashion industry and efficacy of sustainable fashion attempt.

2. Methodology

Qualitative methodology including interview, secondary data collection and analysis are main research methods adopted in this paper. As the paper excludes the investigation on consumer's habits, the method of survey is not preferred. The paper is based on an deductive reasoning in the aim of explaining the phenomenon in fast fashion industry with theory and establishing a new model to analyse the industry in an new era. The very initiative step is to set the unit of analysis, which refers to "the person, collective or object that is the target of the investigation. Typical unit analysis include individuals, groups, organizations, countries, technologies, objects and such."(Bhattacherjee, A., 2012: 9). In this paper, actors that engaging and exerting influence in supply chain in fast fashion industry are the targets to be interviewed.

2.1 Interview

Trost (2010:41) points out that a qualitative interview demonstrates high volume of structure while low volume of standardization. Interviews of main informants from different organizations and actors is one of the major research methods adopted in this paper for primary data collection. Interviewees supposedly selected for this paper include actors and stakeholders in each link in supply chain in fashion industry, from raw material production, fabric & texture production; appareling, transportation, distribution, marketing and reuse or recycle. Interviewing requires interactions of oral-verbal stimuli and reply with means of face-to-face interview and telephone interview (Kothari, C. R., 2004:97). Bhattacherjee, A. (2012:79) offers guidance that before an interview, interviewer should pre-set interview questions and sufficient information for interviewees to verify interviewer's identification to be trusted. In additions, the interviewer should talk with confidence firmness to show proficiency. Interview requests were sent to 5 organizations and companies including ROYAL BAMBOO, Fashion for Good, Fashion Revolution, H&M and C&A, interviewees range from owners of eco fashion stores, chief director of sustainable fashion organizations and initiatives etc. I eventually got replies from contacts from three of the above-mentioned places. Voice recordings together with note-taking is used to record interviews with a semi-structured manner. I listed questions beforehand based on the theoretical framework and during the process of interview some undesigned questions were asked. A focused interview was conducted due to the fact that the paper is developed in a deductive way with the objective of hypothesis-proving and the pre-designed questions were mainly relevant to the respondents' experience and knowledge in this industry (Kothari, C. R., 2004:98).

2.2 Secondary data analysis

Secondary data refers to the collected and analyzed data that is available currently (Kothari, C. R., 2004:111). Main sources of secondary data are reports of government, agencies, corporations, items appear on press or media, published academic papers and so on (Harris, H. 2001:192). Secondary data is regarded to be better substitute for "more expensive, primary data" (Cowton, 1998b: 430) in that it is advantageous in reducing the "social desirability response bias and reluctance to respond to explicit ethical questions" (Harris, H. 2001:193). Secondary data is

also explanatory and instructive for further studies in an under studied field. Research sources for this paper mainly come from academic journals, online reports of corporations and NGOs and statistics of corporations as well as international organizations such as UN, European Environmental Agency etc.

2.3 Limitations

Some limitations either in the research methods or the process of data collection appeared and diminished the validity as well as accuracy of data analysis. Firstly, insufficiency in data accessibility. As sustainability in fast fashion is still a newly emerged subject and stays less studied, so articles can be referred to are limited. Plus, most of academic papers on fast fashion delves into the aspects of business models, marketing or supply chain management but few on the aspect of social-ecological analysis. Second, there are shortcomings existing in the research methods themselves. For instance, data collected based on the theoretical framework may be biased or data may redirect or even derail the main argumentation. “The limitations of this design are that the data might not have been collected in a systematic or scientific manner” (Bhattacherjee, A. 2012:39). Quality of secondary data also varies so that it requires to be assessed beforehand. A lack of evaluation of data quality also reduces validity for conclusion (Hox, J. J., & Boeije, H. R., 2005:596).

3. Literature Review : Ecological Modernization vs. Treadmill of Production

3.1 Ecological Modernization

The neoliberalism concept of ecological modernization emerged in the 1980s represented by main figures including Joseph Huber and Martin Janicke. Its leading role falls to Arthur P.J. Mol who further developed the concept and made it one of the most important theories in ecological sociology (Gibbs, D., & Rx, H, 1998, p.p 4). Distinguished from socioecological models that seek to explain the socifty-environment relations under an evolutionary society scheme, ecological modernization redirects sociological approach to analyze nature and modernity relations, it also aims to investigate the institutional factors behind the consistent environmental crisis. According to Mol and Spaargaren (1992), The fundamental argument of ecological modernization is that the design flaws of modernity can be modified by an "ecological switchover", a transformation of industrial production. Gouldson and Murphy (1997) contend that ecological modernization takes place at the macro-economic level out of technological innovation adopted by individual firms on a micro-economic level. Admitting that market and state as the institutional context of technological development, Mol and Spaargaren (1992) believe that technological innovation occurs automatically in industrial system while the state exerts little influence in it. On the contrary, state will disrupt the process of innovation.

In addition, Mol and Spaargaren (1992) systematically discussed about relations between modernity and different socioenvironmental dimensions, including environment, nature, capitalism and industrialism. Giddens elaborated the relations of modernity with other aspects of socioenvironmental sphere on a broader sense. He embraced aspects of new labor and regional policy with modernity (Giddens, A. 2013). Evolving out of the discontinuist view of history from Giddens and Bookchin (1980) which believes that modern society is a replacement of ecosociosystem and destruction of the "cell-tissue society", ecological modernization stands to the point that nature, society and economic growth can not be reconciled unless a dismantlement of institution (Mol and Spaargaren, 1992: 328). Pessimistically, however, Mol and Spaargaren (1992) held the view that environmental crisis can not be solved considering the current institutional composition in modern society. While in Huber's view, the only way to solve ecological crisis is ecological modernization, specifically industrialization that transforms both production and consumption. Giving insufficient attention to social context and other stakeholders like the state, this view neglects the hierarchy and power relations in implementation of industrialization (Mol, 1994). Also, it fails to answer the questions concerning environmental crisis: to what extent has environmental science functioned to rationalize the relations between man and the sustenance base and what types of institutional reforms should be applied to fix the flawed modernity design (Mol and Spaargaren, 1992:329)?

On the relations among capitalism, industrialism and modernity, there are three main schools of thoughts, namely neo-Marxism, postindustrial society theory and counterproductivity. Adapting Giddens' definition over modernity, capitalism and industrialism are considered to be two

dimensions that characterizing modernity. According to Giddens, A. (2013:55), “capitalism is a system of commodity production, centred upon the relation between private ownership of capital and propertyless wage labour, this relation forming the main axis of a class system...Industrialism is the use of inanimate sources of material power in the production of goods, coupled to the central role of machinery in the production process.” The operation of the “machine” is a coordinated under social organization to incorporate “human activity, machines and input and output of raw materials and goods. ”(Giddens, A.2013: 56)

Buttel, F. H. (2000: 58-59) pointed out that ecological modernization are mainly applied to four major aspects: academic school of thoughts of ecological modernization; predominant discourse of environmental policy; a synonym for strategic environmental management, industrial ecology and eco-reconstructuring and environmental polity innovation on a state level. The paper will be extended based on the ecological modernization as an academic thought. Mol and Spaargaren (1992) upheld that the concept ecological modernization can be used at two levels: theoretical framework and political programs at a practical level. At the first level, ecological modernization refers to the transformation of the process of production and consumption with the subtext of insisting on modernization to tackle environmental crisis. Huber’s opinion is considerably used within this scope. Huber outlined two projects as “ecological switchover” to realize ecological goals: the first is the “development, inauguration and diffusion of new technologies...that benefit the environment” (Mol and Spaargaren, 1992:335); the second is economizing ecology, a neoclassical economic point of view that considers environment as a production factor incorporated in the process of input and output. Seeing development of industrial society with three phases, which are industrial improvement, construction of industrial society and remediation of industrial system via the process of superindustrialization, Huber placed emphasis on new technologies. He categorized modern society into three spheres, that is, technosphere (the industrial system), sociosphere and the biosphere (ibis). The last two are colonized by technosphere so that ecosocial restructuring of technosphere is necessary to fix the design fault of industrial system (ibis). At the practical level, as Mol and Spaargaren (1992:338) pointed out that there are three political programs: the first one is on the compensation for damages on environment and the adoption of additional environmentally-friendly technologies; the second one focuses on the technological revolution and economic evaluation of environmental resources in altering process of production and consumption; the third one is demodernization-oriented that attempts to deindustrialize economy and current production structure into a smaller-scaled and more closely connected between production and consumption (Mol and Spaargaren, 1992:339).

3.1.1 Ecological Modernization-A Consumption Perspective

Another dimension in industrial society that has been under investigated and paid far less attention to under the framework of ecological modernization is the consumption end, which is represented by Cowen and Spaargaren, G. Evolved out of Giddens’ structuration theory, the analysis on the concept of “environmental behaviour” and “sustainable lifestyles” is rooted in social-psychological models and economic models (Spaargaren, G., & Van Vliet, B. 2000: 52). Human behaviors are studied against the context of social practices. The analysis of cunsumption behaviour is based on the core concept of “duality of structure” which denotes “dual character of the rules and resources involved in the (re)production and transformation of social system that

composed sets of social practices situated in space and time." (Spaargaren, G., & Van Vliet, B. 2000: 54). Achievement of a sustainable lifestyle requires actors to operate their lifestyle sector with a perspective of environmental management, including gaining knowledge of green knowledge; pursuing a rational balanced choice between economic, ecological, social capital and cultural fields. It is also a demonstration of self-identity. There are different approaches serve to explain the connection between lifestyle choices and institutions, which also echos to the fundamental logic of ecological modernization.

Apart from social psychological and economic model of analyzing consumption, the System-of-Provision of consumer behavior also has its voice made. Under this system, there are vertical "provision perspective" and horizontal "distinction perspective". Distinctive perspective focuses on the class of "petite bourgeoisie" and the cultural part behind their choice including "aesthetics, fashion, identity and the dream-world of shopping malls." (Spaargaren, G., & Van Vliet, B. 2000:58). The importance is given to the system-of-provision perspective, which highlights functions of products and service provided. It beholds that the provision of products and service is shaped by the commodity chain. The consumption choice is made on the basis of comfort and convenience which can be attained with the "tools" of environmental innovation (Spaargaren, G., & Van Vliet, B. 2000: 71). It is noticeable that consumption is still affiliated to the production dimension of ecological modernization. It adds up the cultural and social factor to the dominant political economic analysis of production and consumption process in industrial system. However, its focus on the individual consumption choice is devoid of connection to a social environmental context and neglects the fact that the consumption habit is also shaped by production side, like what and how many products are produced and released in market.

3.1.2 Critiques of Ecological Modernization Theory

Ecological modernization is also faced up with some challenges. It chooses western society as its specific analytical object (Spaargaren, G., & Van Vliet, B. 2000: 56) while attaches little attention to that in the Global South and the differences within European countries. For instance, research done by Andersen (2002) displays that Eastern European countries show a substantial diversity in the ecological improvement they gained and some irrelevance between modernity and sustainability. It reduces the plausibility of this theory and also, according to Christoff (1996: 497), harbors the potential danger of being used as a political discourse that covers up the resistant and critical elements of ecological components while beautifies the technological innovation and industrial system, a case in point is green washing. Its technological deterministic component restricts its attention to other enabling factors like cultural and political (Mol and Spaargaren, 1992:337). York, R., & Rosa, E. A. (2003) challenges ecological modernization in four major aspects: "the logical of institutional claims; appropriate methods for assessing probabilistic processes; analysis unit for assessing empirical predictions and the pace of eco-efficient transformation of production." (York, R., & Rosa, E. A., 2003: 272). They found out the disconnection between contemporary institutions and actual environmental reform.

They also questioned the methodological imperfection, case study, adopted by mainstream ecological modernization research. Most importantly, in some cases, the conclusion of ecological modernization are contradictory. On the whole, the more modernity achieved, the more efficient economics became. Nevertheless, there is weak evidence manifested in an equally positive impact modernity have on environment. On the contrary, dominant amount of empirical experiences show

that deepening modernization accumulates the impacts on environment (York, R., & Rosa, E. A., 2003: 282). Moreover, despite positioning institutional transformation in the pivot role, ecological modernization does not provide feasible measures to categorize and fuel institutional changes, nor does it point out the possible way of participation and stakeholders involved, especially the lack of analysis on the role of state. Thus, it is unable to demonstrate the power relations facilitating implementation of technologies as well as more more profound institutional changes (Gibbs, D., & Rx, H., 1998: 12).

3.2 Treadmill of Production (ToP)

3.2.1 The Development of ToP and Its Initial Logic

The eco-Marxism theory of treadmill of production was firstly introduced by Schnaiberg in 1980 (Clausen and York, 2008; Foster, 2005; Jorgenson and Clark, 2009; Jorgenson and Rice, 2005). The historical-observation-based concept was initiated against the context of the rising population, consumer greed, environmental social movements and the rising awareness of the environmental impacts the production exerted in the late 20th century in the United States and corresponding social as well as political response to it (Schnaiberg, A., Pellow, D. N., & Weinberg, A., 2002:1). The concept derives from the theories of monopoly capital and political capitalism. Foster, J. B. (2005) defines it a "functional equivalent of capitalism". Within the scope of Western Europe, capital accumulation facilitates new technologies that squeeze labors out of production process to guarantee a more efficient profit-making pattern. Schnaiberg and his group elaborated two aspects the new production system changed its relation to environment. First, modern factories that driven by a larger amount of input employ more machines that considerably increase production level and require more raw materials as well. Second, "new technologies" developed and applied to production are usually more chemical / energy-consuming and labor-intensive (Schnaiberg, A. et. Al, 2002:2). Thus, "environmental withdrawals and additions" deteriorate as the treadmill accumulates (Gould, K. A., Pellow, D. N., & Schnaiberg, A., 2015:26). Foster (2008:8) mentioned six dimensions of treadmill logic, which are first, wealth accumulation within a small group of people; second, employment pattern of workers from self-employment to wage labors attached to the production system; third, the struggle between business necessities and the newly-gained wealth invested in new technologies to expand production; fourth, insatiable greed for more is fed by the manufacture; fifth, nation state plays significant role in boost national economic growth while to some extent ensure the "social security"; sixth, communication and education contributes to the solidity of priority and dominant values of treadmill. Foster (2005:8) upholds that the moral transformation of the society does little to cease environmental degradation in that treadmill of production is the core social institution.

Treadmill of production is not a static concept but evolves against different eras. As a realist-materialism-oriented ecosocial concept, its influence is on the wane in the early 21st century characterized with neoliberalism, "postmodernization" of sociology and the rise of cultural sociology (Buttel, F. H., 2004:326). Buttle criticized that the dominant treadmill scholars did not explicitly point out the changes in theory but just specified its superiority compared with other divergent theories as a continuity of original version. Meanwhile, there is lack of attention paid to the dynamics on a macrosocial level. Buttel, F. H. (2004:332) contends that the fundamental

assumption is still the capital-intensive economic expansion let by social structure and state intervention that gives rise to environmental degradation. However, changes occurred in several aspects including the "treadmill organizations" that united to intensify the speed-up of treadmill; the declining influence of the school of scholars leading in the theories of monopoly capitalism and state financial crisis; then the shift of analysis unit, which moves from nation state to globalization, locality and so on; the last but not least, which is most obviously seen in Schnaiberg's works, the change of "intellectual adversaries", from neo-Malthusians to the ecological modernization (ibis). The most highlighted shift of treadmill in a new era is its emphasis on the context of globalization.

3.2.2 Treadmill of Production as a Theoretical Framework

Treadmill theory is a political economic system that integrates the stakeholders in economic, social and environmental aspects (Gould, K. A., Pellow, D. N., & Schnaiberg, A., 2004:297). The accumulation of treadmill is the outcome of climbing "industrial production, economic development as well as increasing consumption"(Gould et al. 1996:5) boosted by multiple productive forces including technology, machinery and labor. The core of treadmill of production theory is its basis on the solidifying of capitalism system that is facilitated by an increasingly toxic-intensive process of extraction and production that deteriorates environmental withdrawal and degradation and damages ecosystem (Stretesky, P. B. et. al. 2013:235).

- Economic growth as the major driven force of the expansion of treadmill.

Treadmill theory was originally an economic dynamic theory with the primary assumption that capital investment increases the demand for natural resources extraction and the worsening social welfare condition of production workers as well as the environment. Its accumulation benefits the political and economic power of shareholders that mainly represented by investors and managers (ibis) and generates more profit, which in turn further requires more extraction of natural resources (Gould, K.A .et. al, 2015:11). Economic growth as the most significant strength that fuels the expansion of treadmill, is regarded as the solution for the social problems triggered by itself. Other factors that fuel the speed-up of treadmill include increasing "socially dislocating growth" and social support mainly from workers, politicians from investor managerial groups and family. Tied up in the treadmill of production, workers are paid with wages to sustain their lives, among them middle class workers benefit the most from treadmill system. In this regards, workers and their family are firmly supportive of the production system (Gould, K. A. et. al. 2015:15).

- Power distribution in treadmill of production.

The key aspect in treadmill theory is its focus on how social institutions influence the natural world and the process of policy-making. Structural inequality, power and conflicts are underscored as important components in social structure (Gould, K. A. et. al. 2015:16). Treadmill model considers different actors and advocates collective actions. State is seen as a carrier of class struggle and supreme power. State is an important actor in regulating, organizing and enforcing environmental legislation and production activities. The model also attaches importance to non-elite individuals, specifically workers in the production chain. Schnaiberg (2015:23) believes that workers literal involvement in production activities may make capital investors to change their production means or management in the process.

- Transformations and Adaptability of Treadmill Theory in a New Era

In the late 1980s, globalization and trade liberalization took the dominant trend in the world. “Increasing the return on investment” outshone the goal of achieving social and environmental improvement. Through the process of globalization, the transnationalization of treadmill comes into being (Gould, K. A. et. al. 2015:16). More unemployment, deepening inequality and decreasing income in most developing countries brought more profit to the investors in the Global North. What’s more, the increasingly influential operation of private sectors on a global level eroded the sovereignty as well as competitiveness of each locality involved in the system. As a consequence, their ability of protecting local environment and maintaining a stringent local law was diminished. Hegemony within treadmill system is intensified (Gould, K. A. et. al. 2015:16).

What makes treadmill theory distinguished from other ecological sociology theories is its consideration of the role of state and also the fact of deteriorating ecological scarcity (Foster, J. B., 2005:11). Heavily relying on Kolko’s analysis of political capitalism in which state is viewed as the main force of accumulation, Schnaiberg’s explanation of the role of state in speeding up treadmill lies in that state pursues military expenses and an economy of waste while pays little attention to the negative environmental and social impacts caused (ibis). As a consequence, treadmill as a capitalism system of production can hardly be revolted from below. To curb the expansion of treadmill, labors should be equipped with awareness of relocation of surplus and knowledge of substitution for the existing capitalism system (Foster, J. B., 2005:12). This propose neglects the gloomy fact that there is no other alternatives for workers to choose in the current world system. that implies the institutional changes led by corporations, the treadmill of production holds the opposite political economic idea that firms play a counteraction to ecological and social progress.

4. Sustainability in Fast Fashion Industry

Fast fashion is one of the most important global industries that engines the world's economy. According to Mckinsey&Company and The Business of Fashion (BoF) report, in 2016, overall value of fashion industry totaled 2.4 trillion USD, equaling to the seventh largest economy all over the world. Despite the fact that a gloomy economic downturn shakes fashion industry, slows down its growing rate and adds more uncertainties in its long-lasting stable development, the global apparel industry still maintains general upward trend except for the downturn in 2016 (). Asia Pacific and Europe took over 60.7% of the global textile mills market value in 2016. In 2018, the sales growth of fashion industry in Asia Pacific area climbed from 6.5 to 7.5 percent. It is estimated that the number of growth rate higher than average in this region will go even higher from 3% to 3.5%. Even for North America which has the lowest sales growth among all, it still remains at the rate range of 1% to 2% (The Statistics Portal 2018).

The drastically expanding fast fashion industry creates tremendous social and ecological problems. Characterized with being chemical toxicity-intensive and substantial water consumption, clothing industry is regarded as the world's second largest polluter after petroleum industry. The whole life cycle of fashion industry is incredibly polluting like raw materials plantation and processing, transportation, distribution and using. Take one of the mostly used material, cotton as an example, of which plantation requires a large portion of pesticides nearly totaling 10 % of annual world synthetic pesticides usage (Gam, H. J. et. al., 2010:). Producing one Tee or a pair of jeans requires 20000 liters of water (H&M: *Cotton*). Moreover, dying of garments and laundry of clothes also consumes excessive amount water and generates discharge. The discarded or over storage of clothes also adds up the burden of landfill and solid waste disposal. A very self-explanatory case is that the upmarket fashion label Burberry incinerated unsold clothes, accessories and perfume worth over 28 million pounds last year, 90 million pounds in total in the past five years, to save the exclusiveness of its brand (BBC: *Burberry Burns Bags, Clothes And Perfume Worth Millions*).

4.1 Defining Sustainability

Sustainability in the modern world refers to a "guiding principle for both policy making and corporate strategies." (Finkbeiner, M., et. al. 2010:3309). Initiated by Brundtland, the World Commission on Environment and Development introduced the concept of sustainable development and made it widely accepted globally. It is a concept that embraces aspects of environment, economy and social justice of which development can satisfy current generation's need while does not limit that of the next generation (Finkbeiner, M., et. al. 2010:3310). The major concern of sustainability is scarcity of natural resources that is significant for our survival while can be exhausted within a certain period of time (Kuhlman, T., & Farrington, J., 2010:3437). The concept of sustainability contains two dimensions: the integration of three aspects of environment, economy and society; differentiation of weak and strong sustainability. It emphasizes the harmony of development and environment (Kuhlman, T., & Farrington, J., 2010:3438) and reaches to a more specific concept explaining what resources of natural resources, environment and capital we are capable to leave for the next generation (Kuhlman, T., & Farrington, J., 2010:3443).

There is different emphasis on each dimensions in the concept of sustainability. According to Robert Solow (1993:168), "Sustainability is not always compatible with discounting the well-being of future generations if there is no continuing technological progress." Natural resources can always be substituted by capital in the form of new materials or more efficient use of natural resources produced for similar amount of end products. A key question mentioned for the efficiency of sustainability is how much capital is needed to make up for the loss caused by depletion of natural resources in terms of being substitution and for how long this substitution can be sustained. (Kuhlman, T., & Farrington, J., 2010:3441).

Environmental sustainability means preserving natural capital provided by environment and used to generate goods and services. It represents a transition from growth to development, from a material increase to a qualitative improvement to a "fuller, greater or better state." (Goodland, R., 1995:9). According to Goodland (1995), the sink and source functions are fundamental environmental services required to implement sustainability. In this regards, environmental sustainability covers four major activities the use of resources (renewable and non-renewable) and "pollution and waste assimilation". Ramjohn (2008) summarizes four solutions for environmental sustainability issues, which are waste emission control, guaranteeing regeneration and application of renewable resources, minimizing extraction of non-renewable resources and keeping the balanced rate of depletion less than that of creating renewable resources alternatives.

Ostrom, E. (2009) put forwards an analysis framework of sustainability of social-ecological systems in which he creates a system that demonstrates interactions among resource units, resource system, governance system and users under the context of economic, social economic and political settings. He believes that scientific knowledge is necessary in maintaining sustainability in social-ecological system while the compatibility of social and ecological science is hard to achieve. In this paper, the emphasis is attached to the environment dimension with the focus on how to guarantee economic development in fashion industry at the lowest cost of environment and ecology.

4.2 Sustainability in Fast Fashion Industry

Being the second largest polluter in the world, fashion industry demonstrates a strong inclination of overseeing labor workers' social welfare and intensive natural resources drainage (Henninger, C. E.,et. al, 2017:2). Although sustainability in fashion industry has attracted more attention in academic research and practice in recent years, it still remains under studied from a social-ecological perspective.

4.2.1 Conceptualizing Sustainable Fashion

In academics, several terms and concepts are created to conceptualize sustainability in fashion industry, highlighted concepts include sustainable fashion, slow fashion, eco-fashion and ethical fashion etc. There is not yet a unified official definition, but these terms can be interchangeably used and existing explanations provide us a theoretical framework of understanding sustainability in fashion industry. These concepts cover triple principles of sustainability: social justice & welfare, environmental impact and economic gains while distinguish each other from different focus.

They represent an ethical philosophy that responds the mainstream trend of "unsustainable"

fast fashion business model (Henninger, C. E., et. al, 2016:401). For instance, ethical fashion stresses social welfare like working conditions, certification and traceability (Henninger, C. E., et. al, 2016:400). Slow fashion embraces duel ends of production and consumption (Jung, S., & Jin, B., 2014:510). It is a more recent "socially conscious movement" that aims to slow down the production process by transferring designing, producing, consuming, to take more consideration of social and environmental sustainability by producing ethical garments and more importantly, to change consumers' mentality and buying behaviour (Fletcher, K., 2013). Fletcher (2010) points out that slow fashion transfers the contemporary growth-oriented industrial production mode and systematic thinking within this system (Henninger, C. E., et. al, 2016:401). Sustainable fashion and slow fashion can be replaceable with each other. Historically, sustainable fashion is a part of slow fashion movement but it attaches more importance to the cost of environment, social justice and economic growth to boost sustainable development, hereby sustainable garment and apparel production. Joergens (2006:361) explains sustainable fashion from the environment perspective: "Fashionable clothes that incorporate fair trade principles with sweatshop free labour conditions while not harming the environment or workers by using biodegradable and organic cotton." Shen, B. et. al. (2014) use a cross-time approach to investigate the changes in sustainable fashion and in people's views on it. They hold the point that sustainable fashion forms the competitive advantages of corporations' marketing strategies and reflect a broader scope of lifestyles. They also point out four categories of sustainable fashion: sustainable production and manufacturing; green marketing; green information sharing and green attitude and education.

Sustainable fashion is also analyzed under the framework of social constructionism which views "reality" as dual and dialectical: a world exists independently with a devoid of interactions and the "reality" built up on the basis of social interactions (Shotter, 2002). Gaps in different interactions against different backgrounds result in different interpretations of "sustainable fashion" and embed different meanings in social identities (Henninger, C. E., et. al, 2016:402).

4.2.2 Practicing Sustainability in Fashion Industry

Sustainability is given increasingly attention and put into practice in modern fashion industry. Main attempts can be categorized into two: Sustainability as corporation social responsibility in fast fashion brands and emerging of slow fashion (or sustainable fashion). Both are adjustment and modification of industrial production process in fashion industry while the former "shows a shift towards changes in their manufacturing process" (Henninger, C. E.,et. al., 2017:22), mainly concentrated on design and producing phase while the latter stresses the slowing pace of fashion production process. Fletcher (2010:262) criticizes the superficial explanation of slow fashion given by media as something with less fast produced. Instead, she gives the all-encompassing definition of slow fashion in practice, which is a brand new growth model differentiating from traditional garment industry; a newly-emerging product or brand that "has a long heritage, durable pieces or classic design". The development of slow (or sustainable) fashion can be seen via the emerging of small-medium sized slow fashion start-ups and brands, organizations and NGOs that intend to promote sustainable fashion. Primary data collected for this paper is qualitative interviews for ROYAL BAMBOO, a slow fashion brand based in the Hague and Fashion For Good, a sustainable fashion organization.

Sustainable strategies are more and more listed as a significant part of marketing strategies of international fast fashion brands. Sustainable attempts range from making garments out from

organic cotton to recycling or reusing textiles to regenerate new clothing designs (Shen et al. 2012). H&M and Zara are cases in point. They claim sustainability as part of their corporation social responsibility and call for a "systemic change to the industry and across the lifecycle of products...by using organic cotton as raw materials, improving the livelihood of a cotton farmer, to encouraging customers to recycle their clothes through our garment recycling scheme." H&M established a scheme of different items of sustainability including materials, working conditions, wages, animal welfare, chemicals and business ethics (H&M: *Sustainable Fashion*). Meanwhile, world's second largest fashion retailer Inditex, which owns well-known brands like ZARA, PULL&BEAR, BERSHKA, STRADIVARIUS and so on, also declares its commitment to people and environment. Inditex launched Sustainable Strategic Plan and issued an all-encompassing sustainable management report stating its corporations' responsibility to supply chain management, community welfare, products excellence, efficiency of resource usage and environmental footprint, product transparency and sustainability team. The report points out that greenhouse emission was reduced by 29% in the past four years. During 2017, 80% of hazard wastes were recycled or reused instead of being sent to landfill (*Sustainable Balance Sheet*: 14-16).

Another main type of practice in intensifying sustainability in fashion industry is new-emerging small start-ups that dedicated in greener, more ethical and more sustainable fashion products, business model and production process. Unlike their predecessors who universally view ethnics in fashion as idealistic, the later comers in fashion industry ingrain more expectations, sustainable education into their business practice (Henninger, C. E., et al, 2017:25). ROYAL BAMBOO is a representative small fashion brand that adopts slow fashion and sells products made from bamboo fabrics. "Slow" is demonstrated in the entire fashion process, from design, production and reuse. All the products they sell are made from bamboo crops which requires far less usage of water, forest and pesticides compared with cotton and not only reduces CO2 emission but also generates oxygen (ROYAL BAMBOO: *Environment*). Apart from using a new type of less environmentally damaging and resource depleting material, what makes it distinguishes from "conventional" fast fashion brands is their concept and practice of selling products more reusable, meaning that its premium quality can better sustain for customers to keep them for longer time. In addition, the production process of its products costs longer time, no excessive product stock and slow pace of manufacturing new design styles (interview with the owner of ROYAL BAMBOO). As a result, the environmental footprint and unnecessary wastes, resources extraction needed for production and generated in reusing is considerably reduced.

5. Socioecological Analysis on Sustainable Attempts in Fashion Industry

The theoretical framework of social and ecological analysis on the efficiency of sustainability practices in fashion industry is re-framed on the basis of indicators from ecological modernization theory and treadmill of production theory. Ecological modernization is a neoliberal theory that in a modern society, industrialization, technological development, economic growth and capitalism system may have compatibility with ecological sustainability and if better, be the driving forces of environmental reform (York, R., & Rosa, E. A., 2003:274). The core argument ecological modernization theory makes is that institutional structural changes derives from the modernization enable transformation of ecological sustainability and help resolve environmental problems (York, R., & Rosa, E. A., 2003:275). Treadmill of production is a neo-Marxism theory argues that accumulation of capital increases capital investment in production level and technological development at the cost of increasing demand for natural resource extraction and worsening condition of labor workers. Its attention covers economic, social and ecological dimensions. In addition to economic engines, uneven distribution and classification of power relations among different population is also a factor that solidifies treadmill of production (York, R., & Rosa, E. A., 2003:278).

Both of them study on the interactive relations institutional changes and environmental degradation have and consider the role of states in promoting environmentalism. Nevertheless, the contexts of assessing are different: ecological modernization talks about actors on different levels including individuals, corporations, industry, nation and globe while treadmill of production is focused on a more macro level of economic development.

Thus, in this paper, the analysis will be made with the framework composed of factors as follows:

- Economic development of fashion industry - accumulation in fast fashion industry;
- Power distribution between different stakeholders - the Truth of Fashion for Good ;
- Efficacy of sustainable innovations - inefficiencies in sustainable innovation.

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Moreover, concerning the relations between fast fashion and sustainable fashion and the innovative attempts to make fast fashion more sustainable, analytical framework adopted in this paper can be referred to Clark's (2008) view of sustainable fashion a challenging role for fast fashion paradigm, implying that sustainable fashion is a slow approach to achieve sustainability within the broad context of fast fashion but not a break or replacement of fast fashion. There is not a standardized assessment on the efficiency of sustainability in fashion industry, single indicators like the sales of sustainable clothing, accurately quantified environmental cost, wage level of workers in garment and apparel factories, can hardly depict the whole picture. Pius, it is less feasible to evaluate whether economic growth attained in fashion industry can pay off the social-ecological cost it caused. However, an analytical framework constructed on the basis of main dimensions in ecological modernization and treadmill of production theories (namely technological development, industry economic growth and power distribution among stakeholders)

can be used as to investigate and predict to what extent can sustainable fashion function to contain fast fashion trend effectively.

5.1 Fast Fashion - An Accumulated Trend

Characteristics of fast fashion industry, integration and internationalization of fast fashion corporations boosts the expansion of industry on a global scope and makes the "fast" production model a dominant business model worldwide.

5.1.1 Fast Fashion - A Theoretical Concept

Fast fashion derived from the concept of Quick Response in American textiles and apparel industry that was confronted with severe competitiveness from discount retailer giants and low-cost suppliers in developing world (Memic, M., & Minhas, F. N., 2011:12). According to Cachon, G. P., & Swinney, R., 2011:778), fashion system is classified into two components: quick response and enhanced design. The former is characterized with short production, distribution value chain and short lead to versatile market demand. The latter refers to high fashion, trendy products design. In addition, fast fashion can be understood from production and consumption ends. The most widely recognized definition from production perspective is that fast fashion has been a trend and more importantly, a dominant business model as well as business strategy in today's fashion industry (Barnes, L., & Lea-Greenwood, G., 2006). In summary, fast fashion can be defined on the basis of three elements: quick responses; frequent updates of assortments and affordability for designed products (Caro, F., & Martínez-de-Albéniz, V., 2015: 7).

"Speed to market" approach is the major business strategy in fast fashion industry. The key part of fast fashion is quickly responding to changing fashion trends and consumer's demands (Bhardwaj, V., & Fairhurst, A., 2010:168). Leading fast fashion brands like Zara, H&M and ASOS disrupt the market by being capable to turn new releases into products within 6 weeks (Lindsey S., 2018). Driven by the high profitability and pressure to meet the increasingly diverse, stylish and constant demands of customers, fast fashion products need to be constantly refreshed, meaning a shorter cycle of production to sale, more frequent releases of fashion seasons etc. (Bhardwaj, V., & Fairhurst, A. 2010:166). For instance, since 1990s, more phases were added to the existing seasons, the frequency of seasons per year doubled or tripled (Bhardwaj, V., & Fairhurst, A., 2010:167). Fashion season Plus, Haciola, Y. and Atilgan, T. (2014:144) summarized six elements of fast fashion, namely product development and design; supplier determination and manufacturing locations; power relations between supplier and retailer; product displaying & management and events organizing in retail stores; coordination between head quarters and retail stores and strategic importance as well as positioning of stores.

In most cases, fast fashion is viewed as a complete consumer-driven process. Fast fashion products are designed and made based on the track and analysis of consumer's preference and urgent demand. Moreover, a highlighted change in current fashion industry is the pronounced rising of consumer' concern as well as awareness of environment, fair trade, animal welfare and organic closing (Bhardwaj, V., & Fairhurst, A., 2010: 171). However, in this paper, we argue that fast fashion is a production-driven process. Gould, K. A., Pellow, D. N., and Schnaiberg, A. (2015: 23-24) criticize the consumerism view with reasons that, first, consumers can choose which product to buy among alternatives already provided to them in market. But they can barely have control over the production process in which producers own and set up sweatshops in low-income

countries or areas and causing environmental damages; second, consumers can only become a relevant actor the process through organized consciousness-raising movements or boycotts.

5.1.2 Fast Fashion Industry: Integration and Internationalization

Most integration in fashion industry takes place in horizontal way, sales and scale of fashion industry is sprawling in a global realm. As seen in Table 1 below, the value of global apparel retail market grows steadily and is expected to have an increase of 31.8% from 2015 to 2020 (WTO: *FASH455 Global Apparel & Textile Trade and Sourcing*). Within the fashion industry, in 2018, the sales growth rates of the world's Top 3 fast fashion retailers, Inditex, H&M and Fast Retailing (UNIQLO), amount to 8.0%, 4.0% and 4.2% respectively (Industry Ranking: 2018).

Source: WTO: *FASH455 Global Apparel & Textile Trade and Sourcing*

Inditex's 2018 annual report points out that operating expenses climbs 3% as a result of "the growth in sales and new retail space added." It demonstrates the process of "capital-as-money" to "capital-as-commodity" in an expanding and accumulated industrial production system.

Globalization of outsourcing and the rapid booming of overseas markets. One of the most pronounced new trends in fashion industry nowadays is the production locations moving to developing countries, mainly Asian countries especially China and Bangladesh, the largest and third largest garment & textile exporters all over the world (WTO *Reports World Textile and Apparel Trade in 2017*). Competitions among production locations erodes the obstacles for treadmill production. The effectiveness of environmental protection done by different localities became weaker in that it has to be suitable for private capital actors of global scale (Gould, K. A., et al., 2015:46). According to Inditex's Interim Three Months 2018 Results, sales in local currencies outside of Europe mounted 8%, among which Asia-Pacific area contributes the most sales. It is estimated that in 2019, China will be the world's largest apparel market. The traditional centers of fashion industry like Paris, Milan, London and New York still remain leading places while transitions to developing world is also taking place. According to Bailey, S., & Bryant, R. (2005:101), within the global capitalism system in which business functions in the process of a twofold Third World with the quests for natural resources and cheaper labour. As a consequence,

severe environmental degradation and social injustice comes into being.

Labor forces that participating in the industrial manufacture also solidify the industrial system to some extent by supporting the system with their family (Gould, K. A., et al., 2004:297) because they are paid with wages that help them sustain their basic living while their living condition is neglected and are paid with a minimum wage out of the basic logic in capitalism production: pursuing maximization of profit. One way of achieving this goal is reduction of cost. It explains one result from treadmill of production model, that is social efficiency is decreased and labors are replaced or living condition deteriorated. Take Bangladesh as an example, of which garment and textile industry is the main component of national economy and more than 4 million people work in garment industry (Youtube video: *New York Times: Rana Plaza Collase Documentary*). Even if workers in garment industry are the most deeply exploited and are confronted with the harshest conditions. They earned 64% less than the minimum hourly wage that can hardly afford basic necessities like food and housing rent (Fashion Revolution). The minimum wage for garment workers in Bangladesh now is 68 USD per month (New York Times). Rana Plaza building collapse in 2013 marked the most devastating catastrophe in garment history in which over 1100 people were killed. Rana Plaza is home for apparel factories of hundreds of fashion companies, including the globally known ones like Nike, Zara, Mango and so on. Even though warnings of building cracks were given, workers were still asked to work in the building. These blood-shed cases unveil the worrisome fact of poor social welfare and living standard in garment and apparel industry (Nadra N., 2018).

The fast expansion of fashion industry globally are attributable to two main forces: low price of fashion products and thriving of online retailing. As is proven by classic economics, “when supply exceeds demand, prices will fall” (Howard, P. H., 2009:1268). The few most competitive players of large-scale in fashion industry reshape the productive model into a factory model in which products are produced in large quantities, together with the faster renewal of new-season products, excessive storage of products come into being and are sold on sale. Lower price means higher affordability for a larger range of customers. Fast fashion is a near shore type of business that preferably operates outlets, franchise, production and distribution worldwide (Tokatli, N., 2008:23). Currently, there are multiple reasons that result in lower cost in fashion industry, mainly are cheaper labor forces, frequent and accessible track of runway releases and thriving of e-commerce. Lower cost is generated out of the low wage earners working in garment and apparel manufacture. The global fashion industry supply chain witnesses a geographical transition from industrial countries to less developed world. Online sales contributed 5.1% to the overall figures in February, an increase from 3.6% in February last year (Cable.T. , 2018).

5.1.3 Evaluation of Fast Fashion Corporations’ Sustainable Attempts - Intidex (ZARA) as An Example

“Economic changes are linked with ecological realities as the expansion was only possible through significant spatial transformations and management changes that led to much larger concentrations in fewer places. As mentioned above, world’s main fast fashion retailers stated their responsibilities in promoting sustainability and excising corporation social responsibility. In the 2018 Sustainability Balance Sheet, Inditex introduced systematically their efforts put in sustainability promotion, including domains of people, responsible supply chain management, product excellence, circularity and efficient use of resources, contribution to community welfare,

transparency & good governance and sustainability team. As one of the mostly awarded fashion retailer, such as Global 2000, Best Global Brands, World's Most Reputable Companies etc., Intidex has achieved outstanding results. In ecology realm, measures taken include launch of new eco-efficient stores, use of renewable energy and so on. Energy consumption of electricity, diesel, water and hazard waste landfill is effectively curbed. "In relative terms, we reduced our emissions by 22% per garment, as well as 20% from the sales compared to 2016." While it is tricky that the scope of indicators mentioned above are applicable in certain scopes, as indicated in the report, are headquarters as well as factories of all its brands (Zara, Pull&Bear, Massimo Dutti, Bershka, Stradivarius, Oysho, Zara Home, Uterqüe and Tempe) located in Spain; all Group logistics centers and "own and franchised stores of the Group in the world". It means that the production process that leads to the most severe environmental footprint we talk about in this paper is excluded in the indicators, not to mention thousands of outsourcing production in other countries, mainly developing countries. Though the Environmental Policy Report claims that strict standards and demands will be enforced in all the corporation's suppliers, it is not the same story in reality. In this regards, this statistics is not referable to support how technological and innovative development in industrial production can create ecological sustainability. As Mol and Spaargaren (1991) argued that "technological fix" is not all ecological modernization is about. Ecological sustainability requires social construction of "green technology" with a radical structural change of institutions like corporations, organizations and fundings (Gould, K. A., et al., 2015:80).

Practically, declaring of promoting sustainability as part of corporation social responsibility is more of a marketing strategy that establishes a responsible image of corporations in public to attract conscious customers. As Foster (2005) put forward that the 6 elements in the logic of treadmill, "the dominant means of communication and education are part of the treadmill, serving to reinforce its priorities and values", customers may be convinced so that their buying behaviour will be influenced, which in turn, intensifying the treadmill as well.

5.2 Power Distributions in Fashion Industry - A Case Study on Fashion for Good

In addition to horizontal integration in fashion industry, vertical integration mainly characterized by acquisitions also contributes to the enhancement of fashion giants' power and consolidation of the whole industry. For instance, LVMH, the world's leader in luxury fashion that owns almost all worldwide reputable brands including Céline, Kenzo, Loewe, Marc Jacobs, Fendi, Louis Vuitton so and forth, proved its consolidated control over Christian Dior by spending 13.1 billion euro on its shareholding. Merging & acquisition and fewer but more powerful fashion retailers has become a more seen trend in global fashion industry.

Small sustainable fashion brands can barely compete with major fashion brands and retailers, thus, an unparalleled power distribution. More importantly, the private sector has far less influence on public policy-making and other social sectors, like corporation-funded universities or research institutes, of which voice is more heard and recognized (Gould, K. A.,et al., 2015:95). A coalition of small sustainable fashion start-ups is needed to cushion the structural penetration. Fashion for Good is a sustainable fashion initiative that provides a platform for innovative small fashion start-ups and explores "sparking and scaling technologies and business models that have the greatest potential to transform the industry" into a circular fashion system. Funded by C&A, partners that collaborating with Fashion for Good include known fashion retailers and brands that

have robust performance in fashion industry including adidas, PVH Corp, Stella McCartney and Zalando. The initiative released the world's first "comprehensive toolkit on the product development of "Cradle to Cradle Certified TM" (C2C) apparel products , an assessment guide for denim, C2C Certified GOLD jeans and C2C certification regarding Material Health. The establishment of the global initiative is a practice of the core of ecological modernization theory, namely putting "inventions, inauguration and diffusion of new technologies " as the key in the production process (Spaargaren, G., & Mol, A.P., 1992:13). Nevertheless, the innovation and certification may generate counter effect in practice by further differentiating power distributions among different stakeholders within institutions and intensifying consolidation of corporation powers, which will translate into political power that adds up to treadmill of production.

5.2.1 The Politics of Certification

The study on certification politics is conducted from the consumer angle while the main focus is on industrial production system that excels in its power and shapes consumers' behaviour for the purpose of consolidating and culturally permeating in the production system. According to Eden (2011:171), certification comes into being due to the "distancing" of traceability, not only geographical but more a social one that is created and taken advantage of by dominant actors in industrialized production to convince customers and influence their consumption choice. Coined as "consumer fetish", customers' choice of buying things is attributed to individual behaviour while the truth of presentations of commodities guided by corporations is disguised and made innocent. Consequently, this kind of cultural politics of consumption directed by corporations rationalizes industrial production that will lead to environmental degradation and labor exploitation (ibis). As consumers are becoming more and more conscious of what they buy, who made them, how were they made and even the environmental footprint generated during the production process, so they have to be led think in a certain way, to be "educated" to "choose" more "ethical and better-quality" products, which in fact, are products that embrace more advantages to producers (Eden, S., 2011:175).

Power is another problem in certification politics apart from knowledge. "power is not immanent or static, rather, power is produced through ongoing economic but also cultural, social and environmental relationships, emphasizing that we can not simply take power differentials or effects for granted, especially within the global economy."(ibis). In a capitalism system, power is accumulated in powerful corporations, in certification politics, power is not only exert on consumers but also on small-scale and less competitive business. Cost of paying for assessment and test procedures and of "'corrective actions' to production and management" is one of the main factors that differentiates actors with different strength (Eden, S., 2011:174). For example, in C2C certifications on Denim, the assessing standard including indicators like material health, material reutilisation, renewable energy, water stewardship and social fairness. Plus, the verification of garment is based on European standard specification. The whole testing procedure costs 3 to 6 months with the costs from 15000 to 23000 USD (Fashion for Good: *C2C Certified "How-to" Guide*). A possible outcome is predictable that those who are unwilling or are barely be able to afford the test will be excluded out the game and be deprived of competitiveness in the market in which games rules are set and adjusted for the favor of the very few most powerful corporations. It is perfectly exemplified by Fashion for Good, which is more of a business coalition than an environmentalism organization. Both ecological modernization and treadmill of production theory

contend institutional, or structural transformation as premises of ecological sustainability achieved with the usage and diffusion of technologies. While the pattern Fashion for Good is following and implementing is still affiliated to an industrial production system instead of applying a new productive or political model that breaks down the uneven power distribution among different fashion players. Thus, the small-scale start-ups with awareness of sustainability and ethics can only be able to attain similar revenue and to compete with those successful "early comers in fashion industry" by adopting a fast and of large-yielding production system. Small businesses are locked up to the "treadmill" in the process of corporation consolidation supported by "treadmill organizations".

5.2.2 Lessons Learned from ROYAL BAMBOO - Small Business in a Big Corporation System

As introduced before, ROYAL BAMBOO is expected to have great potential in market as an ethical slow fashion brand. However, the difficulties it faces up with are also institutional, complicated and rooted in power structure. Although the sales rate and marketing scale shows an optimistic growth in general, mostly attributed to online store and social media, ROYAL BAMBOO is still in an eager struggle to increase its visibility in market. On one hand, very limited number of people have the "knowledge" on quality and sustainability of the material bamboo fabrics; on the other hand, the brand confronts big challenges in their strive for a higher presentation to the market. According to the owner of the brand, they tried to get access to big, frequented shopping malls to promote and sell their products, frustrating however, they never received any replies from the retailing department, not to mention permission to access. The reason is that only bigger, well-known and wealthy brands which can pay the mall management a huge amount of "administration fee" will more probable to have the approval to present their items in the mall.

This case explicitly demonstrates social and power structure's role as a precondition for new technologies to be translated into a positive tool to benefit environment. The shopping mall acts as a "treadmill organization" by setting threshold that blocks small business from entering the market. So those more powerful fashion corporations which are "qualified" to present their products gained more competitiveness as well as power in the market. In turn, the economic growth and market rate expansion owned by the more competitive players are translated into political strength in social, cultural and trading process, so that the consolidated corporations can lobby or exert pressure on the policy-making process of equally or more powerful stakeholders in the institution, like shopping mall. In this dynamic, interactive process, the power of corporations are enhanced, a larger power gap is created to pave a way for the intensification of treadmill.

5.3 Efficacy of Sustainable Innovations - Organic Cotton and Sustainable Products

Apart from the political economic reasons on a broader level mentioned above, there are other factors that diminish sustainability in the practice of sustainable fashion, technological development and products themselves. There are some problems lying in the "green" technological development and products, in this chapter, are toxicity of organic cotton and challenges that sustainable fashion products face, such as limited customers, quality and design.

5.3.1 Unsustainable Truth of Organic Cotton

A mounting number of large fashion corporations step in the practice of using and making organic raw materials to make their apparel. Cotton as one of the major sources of raw materials in garment and apparel industries, is widely grown while is proven to be highly water-consuming and chemical-intensive. The unsustainable truth of organic cotton was overshadowed by the stream of outspoken responsibility and sustainable attempts claimed by corporations. H&M claimed their sustainability strategy by using organic and recycled cotton, which they said to be ethical to environment and workers. It is indicated in their sustainable strategy that unlike traditional, popular cotton cultivation that consumes a substantial quantity of water, pesticides and chemical fertilizers, organic cotton "contains no genetically modified organisms...and has been grown according to a strict standard and checked by an independent certification body." (H&M Group: *Cotton*) The certification body and standard are not specified further, neither are the enforcement body and sponsor, who direct policy-making for the interest of their own community. There are also no details of social, economic and environment cost of it cultivation, how organic cotton is cultivated and contributes to the livelihood of farmers and environmental sustainability.

It has been proven that organic cotton contains more toxicity, consumes more water and arable lands and generates more environmental footprint in its supply chain (Vivian H., 2017). It is true that being "organic" dose not mean a removal of pesticides and fertilizers but moderate use of them. However, natural fertilizer is not necessarily free of toxicity. On the contrary, a study from Natural Science and Engineering Council of Canada found that natural insecticides are more toxic compared with its synthetic counterparts. Besides, a journal published in *Nature* found that the yield of organic cotton is 25% lower than traditional cotton, while the same quantity of fibers is required to be produced from relative quantity of cotton. So organic cotton farmers have to enlarge the plantation density and scope by applying more irrigation and arable lands. Last but not least, the process that makes cotton into garment basically remains the same, in which the most polluting part is dying. In this regards, there is no difference between the processing procedure of both cottons.

We can not simply make the judgement that the prevalence of organic cotton explains the treadmill of production that more profits made are redirected to technological development which consumes more natural resources and generates more toxicity that worsens environment. As organic cotton is prove by Textile Exchange to be more environmentally friendly in reducing global warming, acidification and eutrophication (Vivian H., 2017), the root of problem rather lies in an institutional level whether the power structure in fashion industry can be readjusted to fragment the consolidated power of multinational corporations and empower civil society and culture instead; how the effects of green innovation can be assessed and usage regulated by a governmental body which has more legitimacy and power to conduct fair and effective environmental governance.

5.3.2 Imperfections in Sustainable Products

Based on secondary data collection, observation and interview data, the findings display that product quality, price and style are the main elements consumers consider before they make their decisions. However, sustainable products stand in a disadvantage position compared with conventional products in the three aspects.

Quality of organic cotton product is questioned in the way that "Fashion consumers used to be discouraged to buy eco-fashion due to poor quality, such as scratchy hand feel and uncomfortable materials" (Shen, B., et al., 2014:977). There is also the reason of consumers' lack of knowledge in products made from new materials resulted from insufficiency of product presentation and promotion. In the case of ROYAL BAMBOO, the quality of bamboo fabric clothes are highly recognized and chosen by customers who had them but not in a wide scope. Quality guarantees their concept of implementing "slow fashion" by sustaining for longer time after the same number of times of washing. The main reason is that they can hardly afford advertisement and marketing.

Another factor deterring the popularity of sustainable fashion products is higher price compared with its fast fashion counterparts. According to a survey, people aging from 18 to 37 consist of the largest consumer group in fast fashion market and contribute the most to fashion retailers' revenue. It is not only because of their preference for fast new trend in fast fashion, but more importantly, the high affordability of fast fashion products. Low price of conventional clothing comes from the industrialized fast fashion production model that highlights large volume, cheap labor and reduction of supply chain cost, like raw materials and outsourcing in localities of lower expenses. While in the case of small sustainable fashion businesses, like ROYAL BAMBOO, neither can they afford a mass production and supply chain operation cost, nor can a big storage of clothing be beneficial to their cost because of limited market scale. Moreover, under a trade system that favors "organic or sustainable certification", with the label of "organic" or "sustainable" means a "price premium over non-organic product." (Eden, S., 2011:180). As the conventional fashion giants are also calling for sustainable transformation and optimization in their products and marketing on a large scale, though most of the time without being committed to the ideologies of organic movement (ibis). This "green stamp" and "green wash" (Goodman 2004:910) jeopardizes the status of small sustainable fashion businesses and frustrates the integrate attempt for sustainability.

Last but not least flaw that sustainable fashion apparel has is its style, which is basic, less trendy compared with countless constantly released new designs of fast fashion clothes. The limited design styles is far from satisfying the consumers' demands for aesthetics and fast-fit-in-trend response. According to the owner of ROYAL BAMBOO, they only have four items of products of basic style. For one thing, the new type material of bamboo fabrics can be made into limited styles unlike the various types of materials used in conventional apparels. For the other thing, more style types means more stock, sometimes in an excessive amount. So more costs and wastes will come out of over amount of products stock and products sold on sale. The solution is a better marketing strategy with better photography and matching with other clothes, mostly are bundled with conventional garments.

From the cases of organic cotton and bamboo fabrics products, the penetration and strong political economic power of traditional fashion corporations can still be seen and show their magnetic strength for less powerful businesses into the industrial production and capitalism trading system.

6. Conclusion

With sustainability as theoretical framework, treadmill of production and ecological modernization both try to explain the relation between modernity and social-ecology spheres and to figure out how to reach a balance of economic growth, social justice and environmental preservation. Based on above analysis, fashion industry can be better explained by treadmill of production out of following reasons. First, treadmill of production is more comprehensive in that it encompasses social dimension into the sustainability framework apart from economy and environment. Social fairness in fashion industry, like labor welfare and living, though sometime can slow down multinational corporations' expansion through labor union, consolidates accumulation and speed-up of fashion industry because workers and their family who make a living in garment sector support the industrial system and are locked up within it. Second, treadmill of production values the intervention of state more than ecological modernization, which is a technology-deterministic approach. From the cases of Fashion for Good and ROYAL BAMBOO, we can clearly see the uneven power distribution between large fashion corporations and small sustainable brands. The spillover effects of political economic power of conglomerates magnets more other related actors to operate to their favors, the increasingly consolidated power serves as the engine of a treadmill in fashion industry. State as an entity that embraces the ultimate power, can control the speeding trend by making and enforcing legislation that appeals to the benefit of small business and empower other social and civil actors.

The point that I uphold is that sustainability is not simply to acquire social justice and environmental preservation in a way of sacrificing economic growth and modernity improvement, like "degrowth" or "demodernization", but more about economic growth being able to pay off environmental and social costs, to reach a balance between consistent economic growth and long-lasting social-ecological efficiency, including people livelihood, natural resource preservation, and ecological protection. This requires a unified, legitimate definition and regulation of sustainability and how it means in different industries so that responsibilities can be specified. Consolidation of a single stakeholder or few of them is not a positive sign to achieve sustainability but a dynamic balance and fair distribution of powers to different stakeholders. The empowerment of the civil society vs.the state is of great significance. (Bailey, S., & Bryant, R., 2005:122). "States have demonstrated their power over other actors in so far as they have been able to determine who exploits selected environmental resources, the conditions under which those resources are exploited, and often even for what purposes they are used." (Bailey, S., & Bryant, R., 2005:38).

In contemporary fashion industry, fast fashion determines the fast industrial pattern and fast fashion multinational corporations own the dominant power. Under current institutional context of production pattern, marketing and trading system, power distribution and capitalism system, slow fashion, sustainable fashion and other newly emerging sustainable concept or model is unable to replace fast fashion because the power they have and the social, political economic structure they are in does not allow a radical dismantlement of existing system. In practice, it is more feasible for small sustainable businesses to seek for a coalition of relevant stakeholders to mobilize for a more fair distribution of power and to create a proper structural premise for the diffusion of technological development to benefit the effectiveness of sustainable attempts.

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