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A Holistic Approach of Sustainability to Economics, Ethics, Environment, and Quality of Life Cycle Time of Production

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Abstract
Consumerism is the particular relationship to consumption in which we seek to meet our emotional and social needs through purchasing. Overconsumption exists when households take far more resources than they need and then it is believed that, the world can be sustained and developed. The new paradigm provided here is diametrically opposed to and distinct from the elements of contemporary sustainability. According to this topic, the shortening of a product's lifecycle is a result of the present paradigm's assumptions, attitudes, and values. This notion refers to the present sustainability as "If things, products do not wear out sooner, factories will be idle, and people will be unemployed." The newly proposed sustainability is closely tied to the notion of development, which examines the demands of the present by providing future generations with the capacity to satisfy basic household needs. This comprehensive viewpoint eliminates barriers between industries and specialties. In this setting, interconnectedness is critical for long-term growth. The production is subject to unlimited economic needs. This comprehensive viewpoint eliminates barriers between industries and specialties. In this setting, interconnectedness is critical for long-term growth. The unlimited economy needs of Turkey's output are determined by the quantity of family consumption in their way of life, which seeks spiritual happiness and ego gratification in consuming. Obsolescence causes hyperconsumerism, which results in rising quantities and kinds of both solid and hazardous waste, necessitating appropriate waste management. As a result, the carbon footprint represents all greenhouse gas emissions over the course of a product's life cycle. This is a paradigm that will not support world existence, and a paradigm change is required for a truly sustainable planet as well as the macro-level sustainability of supply chain management systems. Consumers may make a big contribution to lowering the carbon footprint of products. Environmental products and services are critical components of the sustainable development process. The purpose of this study is to present an overview of current's sustainabilty concept and new paradigm of sustainability paradigm. In addition, this research aims to define an implementation about apparel sector in Turkey to detect errors of negatively that affect production in a textile business, to define and decrease the effects of negative factors and it involves which ranked according to their primary with Faiure Anlalysis and also this research provides to reduce the risks, achieves the results of application and gives the importance of gas emission for garment industry.
Keywords: Consumption, Environment, Industry, Life Cycle Expactancy, Sustainability.

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1. Introduction

Sustainable improvement has been declared like that "improvement which includes the requirements of the current time in the absence of agreeing the capability of the next production to provide households own requirements and basis needs" (World Commission on Environment and Development Report, 1987-Url 9). Sustainability is a balance situation which can be applied in all influences of supporting actions, including social, ecological and economic, financial impacts. The definition of sustainability is focused on the interconnection between the natural ecological-environmental scope and social life. Much more research is being done on the relationship between pollution, economic development, and societal development in both developed and emerging industrial nations. Reduced carbon dioxide footprints, pollution, energy resources for ecological change, government impacts, strategic policies, laws, and restrictions within the subversion of societal values have all been explored and investigated in the research. The findings give dependent and independent values that link the research to the paradigm of sustainable development. Some variables depend environmental dimension of sustainability, which have a negative impact on economic improvement and also the sociable dimension variables have positive impact in relation to economic development in this research scope (Url 2, 2016; Url 9; 2015).

2. Environment, Society and Economic Growth

Materials, energy, water usage, nature and biodiversity, greenhouse gas emissions control, and waste management are among the environmental aspects. The social indicator group is based on external connections, human rights, the elimination of injustice, freedom of association, the eradication of forced or compelled labour, and the successful abolition of child labour (Url 8; Url 11). According to Bassen and Kovacs (2008), indicators of Corporate Social Responsibility (CSR) suggest a fast, condensed general view over an actual performance of businesses on extra-financial matters. Indicators have three basic functions. These are control, communication and improvement. Indicators help the managers and employees of a company to measure and therefore firms manage and control the resources under their responsibility. Furthermore, indicators determine the performance to internal staff and management as well as external stakeholders. Finally, they support performance improvement as they define the differences between the actual and destination situation. These are summarized in Table 1.

Table 1. Summary of Sustainability Management Indicators for Global Worldwide (Indicators of Sustainable Development Directiosn, Global Development Indicators- Url 1; Url 7; Url 8; Url 10 and adapted by author)

Poverty Options	Unemployment Rate ; Poverty Index ; Population living Below Poverty Line
Population Stability	Population Growth Rate Trend; Population Density
Accessibility	Telephone Lines per Capita Information Access
Economic Growth	GNP; the level of individualized Purchasing ; National Debt /GNP ; Average Income ; Capital Import ; Foreign Investment
Human Health	Average life cycle span; Access to safe, clean drinking water ; Infant mortality ratio
Living Conditions	Urban population Growth Rate ; Floor area per capita ; Housing Cost
Consumption	Forest area Change ; Annual energy Consumption ; Mineral Reserves ; Fossil Fuel Reserves ; Material Intensity ; Groundwater Reserves
Generation	Municipal Waste; Hazardous Waste; Land occupied via Waste ; Radioactive Waste
Atmospheric Impacts	Ozone diminishing emissions; Nitrogen Oxides emissions; Greenhouse gas emissions; Sulfur oxide emissions
Agricultural Conditions	Pesticide, hazardous usage ratio; Fertilizer usage Ratio; Irrigation % of cultivable ratio.

2.2. Fashion Framework

A brand or a mark cannot tell you how much energy, waste, or water went into making a piece of clothes. Clothing and apparel are one of the key industries, as it relates to climate change in terms of carbon emissions, water footprints, and energy footprints per capita (Url 4, 2015; Url 11, 2015).

2.3. Water footprint

This subject is dependent on energy resources and the use of natural water sources. This notion is known as the Fashion-Stylish Life Footprint, and it refers to the amount of energy, water, and other resources used in the production of a piece of apparel. Purchasing a garment incurs a significant amount of monetary expenditures, accounts for around a quarter of overall embodied energy footprints, and is particularly costly due to the high proportion of coal-fired power use in the textile sector. After the paper and oil industries, the garment industry is the third largest user of water resources on the planet. Water scarcity is a major issue for producing threads and textiles. Cotton makes about 90 percent of all threads used in the clothing business. This may be found in 40% of all clothing created across the world. Cotton cultivation is the single most important water consumption criteria-component in the garment-clothing supply chain system. To produce 1 kilogram of cotton, the cotton industry requires 30,000 gallons of water. A cotton shirt uses about 2.7 liters of water to make (Url 2, 2015; Url 3, 2015).

Cotton is a highly important material in the fashion-stylish sector since it determines how much water is used. During the investigation and assessment, textile-garment coloring – dying processes are estimated to account for 17 to 20% of industrial water pollution. 8.000 synthetic hazardous chemicals are utilized all over the world to convert raw materials into apparels and textiles, with much more ending up in natural water resources. The fashion industry's supply chain management framework is not only linked to reliability, but also to the industry's troublesome connections. In the poor world, the impact of household washing clothing at home is about important inside a key ratio of which causes from washing apparels by hand (Url 3, 2015; Url 5, 2015; Url 6, 2015).

2.3. Carbon footprint

Focusing on the estimated yearly global garment-textile manufacture of 60 billion kilos of cloth-textile materials astounds the mind: 1.074 billion KWh of power and between 6 and 9 trillion liters of water. Climate change is extremely essential for the environment and public health. In order to counteract climate change, it is necessary to make optimal use of natural resources and reduce pollution, while taking into account the country's circumstances. (Url 12: Carbon Footprint of the Textile Industry) Within this framework, it is targeted to (Url 3, 2015);
- For energy efficiency, a detailed technical change is required.;
- Increase the use of ecologically least destructive and hazardous inputs during manufacturing and production, - Increase the reuse of waste heat generated during production operations,
- Increase the proportion of high-value-added items in manufacturing; - decrease the sector's environmental damage. It is aimed at improving and evaluating environmentally friendly apparel-garment clothing sector technology within this framework (low CO2 emission, bio-fueled, hybrid and electric engine technologies, energy, carbon, water footprints),
- organize and arrange manufacturing stages, procedures, and inputs such that environmental and human health are not harmed.
- Promote collaboration and affiliation with other industrial sectors in the utilization of waste and leftover materials.

Three items that industrial structures might simulate from universal environmental lifecycles. These items are as below (Boons and Bass, 1997; Erkman and Ramaswamy, 2003).
1) Lowering energy use, disposal, and CO2 emissions, as well as depleting raw materials and natural resources.
2) Disposal of waste and items, such as input for further industrialized, manufacturing processes, and activities
3) Establishment and development of sophisticated and manageable structures to allow for and reconcile unanticipated replacements and variations in the framework of the system's environment.

3. Quality Oriented Development of Sustainable Management

In terms of quality assurance, and according to the definition of quality, it is apparent that the word quality has many distinct meanings, and quality assurance activities and procedures vary at various phases of the product life cycle. The link between quality and product life cycle is summarized in Table 1 (Indicators of Sustainable Development Directions, Global Development Indicators- Url 7; Url 8; Url 10; Url 11 and adapted by author).

The failure risk analysis approach is used to discover failures or faults in executed projects before they become dangerous, and this methodology allows to identify and regulate the priorities in resolving failure problems, as well as to remove prospective failures and hazards before they occur (Slinger, 1992; Healey, 1994; Ben-Daya and Raouf, 1996; Akin, 1998; Sankar and Prabhu, 2001; Chin et al., 2009).

*Failure Mode Effect Analysis implementation process consists of three stages. These are ordered as below (*Akin, 1998; Sankar and Prabhu, 2001; Chin et al., 2009).
-Preparation stage -System Analysis stage -Evaluation of results stage
Failure Mode Effect Analysis process can be implemented in the following sequence;
-Definition and explanation of functions
- Definition and explanation of failure modes
- Definition of failure causes
- Definition of failure probabilities
- Definition of failure severity
- Definition of failure detectability
- Calculation of risk priority indicators and sequencing in decreasing order.
- Summarization as taking precautionary measures toward reducing risks and failures.

The frequency of failures should be established once the probable failure types, causes, and possible impacts have been described. Each failure mode's emergent frequency can be calculated mathematically or subjectively by an expert, given that relevant prior data is analyzed. Following the characterization of failure mode frequencies, another critical task is the defining of failure severity. Failure severity is defined as the amount of aversion caused by unfavorable conditions caused by failures in achieving the main goal of a product, service, or process. The difficulty of detecting failures refers to the difficulty or possibility of detecting a failure prior to the completion of a product or process (Healey, 1994; Chin et al., 2009). A Failure Mode Effect Analysis procedure was carried out for components manufactured by the clothing sector, which produces clothes, garments with durable and high-quality fibers, textiles, and raw materials from the textile industry. The generic Failure Mode Effect Analysis process flow has been followed in the scope of this investigation. In the post-processing step, customer-satisfying elements are delivered and the desired outcome is achieved (Akin, 1998; Chuang, 2010; Xiao et al., 2011).
This is the life cycle time of product that maintains the utilizing lengthy time period between new fashion-style on the various clothes and emphasizing quality on the raw materials of textile in this topic while studying the product functional qualities and features of the textile-garment sector. In order to define the risk priority number, essential tables for product-related failure severity, failure likelihood, and failure detectability have been created during the execution of the determination failure procedure for risk priority number (Xiao et al., 2011; Hekmatpanah et al.,2011; Akin, 1998).

3.1. Grading of the Severity

In FMEA studies, a convenient and effective work group must be formed based on the selected and sustainable projects. Because the declaration of concerns, challenges, and risk priority factors in the investigated projects need the participation of personal-team members as well as expertise and know-how-information. At the same time, the project team must include persons with varied job-professions and from various occupation sectors.

Table 2. Failure Mode Severity Rating Table for Sustainable Textile Industry

1	-Product does not create any lack of performance during use by the customer and the customer probably will not see this error.
2	- Low severity level, customers will not see or ignore this error.
3	
4	- I will have a negative impact on performance and create moderate customer dissatisfaction.
5	
6	
7	- It will affect the performance in advance level and will likely cause customer dissatisfaction. Product will be returned.
8	
9	-It will create a high degree of customer dissatisfaction, the product will be returned and the customer will likely want compensation
10	

The objective of FMEA is to categorize failure types. For each failure mode, three index structures are stated based on importance: the occurrence rating (O), the severity rating (S), and the detectability rating (D) (D). To grade each group, a ten-point scale is used, with 10 being the most severe, most common, and least noticeable kind, respectively (Chiozza and Pozzali, 2009; Chuang, 2010; Xiao et al., 2011; Liu et al., 2013).

3.2. Probability Grading

Table 3. Failure Probability -Occurrence Rating Statement

1	- Low probability occurs.
2	-process under control statistically, but errors may occur.
3	
4	- process under control, but values are likely to occur close to the control limits and error probability is on moderate level.
5	
6	
7	-There is a high likelihood of occurrence.
8	
9	-Probability of occurrence of error is very high.
10	-Error can occur at any moment.

3.3 Detection Grading

Table 4. Error Detection Rating Statement

10	- Sending product incorrectly is a very high probability. Product is not controlled or cannot be checked. Error is invisible nature. And cannot be realized in the manufacturing and assembly lines.
9	- Sending product incorrectly is a very high probability. The error is a hidden characteristic.
8, 7	- Sending product incorrectly is an intermediate probability .
6, 5, 4	-Error is a characteristic that can be easily detected.
3, 2	- Sending product incorrectly is a low probability level.
1	-Errors can be discovered at 99.999% probability level and will not be sent to the customer.

The priority of failure type is declared through and depending the risk priority number (RPN) which is described as the component of the occurrence (O), severity(S) and detection (D) of the failure. These possible purposes and causes via the high RPN variables are chosen for the appropriate disciplinal action to reduce the likelihood of failure occurrence. Noticing is also used to various stages of a system structure when failure might result in a consumer reaction and a loss of corporate repute. Risk priority levels (RPL) for FMEA; is calculated by multiplying the Occurrence (O), Severity (A), and Detectability (S) levels (Chin et al.,2009; Hekmatpanah et al.,2011; Xiao et al.,2011; Su, et al., 2012).

RPN=O (Occurrence)*A (Severity)*S (Detectability) (1)

Severity(S): Importance of the effect on customer requirements. Generally, it could not provide anything about this without fundamentally changing the system or design.
Occurrence (O): Frequency with which a given cause occurs and generates failure modes (or probability it will occur)
Detection (D): The ability of the current monitoring and controlling methods to detect before or after occurrence of a given cause. These three factors O, S and D are all guessed using the rankings or scores from 1 to 10 as declared in Table 2, Table 3 and Tables 4 respectively (Akin, 1998; Van Leuven et al., 2009; Xiao et al., 2011; Hekmatpanah et al.,2011; Liu et al., 2013). The failures with higher RPNs are presented to be more important, vital and must be given higher priorities.

For each reason of failure, the RPN must be determined. RPN represents the relative likelihood of a failure mode, with the higher the number indicating a more likely failure scenario. A crucial summary may be created from the RPN to emphasize the areas where action is most needed. According to the resultant RPN, special attention must be presented to any cause of failure with a severity rating of “9” or “10” (Chuang, 2010; Liu et al., 2013).

Risk Priority Levels (RPN) are computed based on these values. These estimated values are sequenced according to the extent of the danger, and preventive investigations were conducted in order to reduce the Risk Priority Levels. The flow structure below depicts the pathways taken in the Failure analysis of the product with a focus on the Sustainable Industrial Cycle Time of Products. Following the computation of RPN, the firm should ensure that the primary detrimental aspects are removed from the specification by re-engineering. These aims are included in the three factors listed in order of desirability (Slinger, 1992; Akın, 1998; Sankar and Prabhu, 2001; Fiorenzo and Maurizio, 2001):

(a) To remove the problem altogether through a design change;
(d) To decrease the possibility that the failure would occur; and
(c) To develop the chances of detection through improved quality control.

Finally, Following the development activities, the severity, incidence, and detection must be re-evaluated, and a new RPN must be determined. The greater the RPN, the more likely the mode will fail, and as a result, this mode prioritizes remedial action (Fiorenzo and Maurizio, 2001; Slack et al., 2001; Chang and Sun, 2009; Wang et al., 2009).

Risk priority levels or numbers (RPL supports the definition of failures to be given priority in failure development studies by making and sorting priority rating.

At the end of these estimations and assessments, relevant solutions are investigated by giving-supporting priority to the relatively higher risks. The advantages of the system are given below (Xiao et al., 2011; Liu et al., 2013);

To increase the product's or project's quality, dependability, and safety.
Customer pleasure must be provided and maintained.
to reduce the time cycle and costs associated with product or project improvement
Identifying and prioritizing design or process development initiatives.
To examine and discover all probable failure mechanisms, their effects, and commonalities for whole products/processes.
To assist and grow in the examination of design needs and design benefits, benefits
To enhance the evaluation of prospective, crucial, and substantial qualities.
Presenting and providing sustainability in the study and design of a new production or project sector.
To maintain a critical medium for failure avoidance.
To make it possible to define corrective and preventative measures, Risk-reduction activities, for example, might be offered to identify and manage risk.

When failure modes are evaluated one by one or in terms of relative group form weights, it is discovered that the weights of failure modes that occurred during the measurement and assessment stage are exceptional situations (Pillay and Wang, 2003; Estorilio and Posso, 2010).

4. Conclusion

Apparel and garment products/goods may have a limited volume of materials that harm eudemonia, health, welfare, and the ecological structure and must be adapted through reduced use of water and pollutants that pollute the air (Url 4, 2015).

Household linen, clothing detergents, and chemical materials should not include any matter, should have a limited influence on the process of seaweed growth in water, and should be mostly perishable and comply with environmental washing requirements (Url 5, 2015).

Machines for washing clothing must have limited detergent use and consumption, as well as a reduction in the amount of water and energy footprints (using up), as well as noise pollution. The items should have a life cycle span (serviceable time) extension warranty that includes a money back guarantee, should not be thrown away after use, and should be repairable as well as recyclable (Url 5, 2015; Url 6, 2015).

Internal and municipal consumption and use, the most fundamental attitudes that may reduce the industry's ecological and environmental consequences, would offer for national consumers to reduce, lower the amount of apparels and textiles that they buy each year.

As a result, a new technique to perfect consumer actions that might assist helpful, useable ecological improvement in the sector is being developed.

In consideration of assisting, the suggestion situations are presented due to the best ecological and social achievement of the provide and reserve of apparels and textiles (modified, summarized from Url 1; Url 2; Url 6- Url 11 and authors' opinions) as below;

-Extending the life of clothing and textiles via repair and maintenance.

-Selling and arranging worn garments and textiles as a result of recycling commercial operations, corporations that might mend and bring back old clothing for sources of used products sale wherever possible, but otherwise take away and recycle the wool, knitting fibers, and threads.

-Purchasing worn clothing and apparel, as well as textile items, where accessible.

-Purchasing fewer but longer-lasting clothing and textiles.

-When acquiring contemporary, diverse items, select those created with the least amount of energy, water footprints, and dangerous matter emissions.

-Only seldom purchase things, commodities created, and made by employees awarded a credible existing pay with bearable recruitment rights and position.

- Rent clothing that has not been used or worn to the end of its lifespan span, serviceable and ordinary period.

- Wash clothing and textile items regularly and at lower blood temperatures, as well as consume and use natural detergents, and avoid ironing possibility.

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