



## TEXTILE INDUSTRY: IT'S IMPACT ON ENVIRONMENT

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### **ABSTRACT:**

Environmental pollution is a term refers to all the methods by which people pollute their environment. It is undesirable change in biological, chemical or physical characteristics of the environment which causes harmful effect. Environmental pollution is one of the most serious problems faced by the mankind. The Textile industry is one of the most pollution creating industry in terms of high solid waste, high biological oxygen demand (BOD)/chemical oxygen demand (COD) content in waste water, hazardous chemicals and dyes etc. There are three basic needs that a man possesses – food, clothing, and shelter. The global textile and clothing industry is bound to be huge, as it fulfills the second basic requirement of man. It is worth \$480 billion at present and is expected to reach \$700 billion, shortly. This is because people are getting increasingly conscious of the way they dress. It has become a means to create an impression and represent their personality. Everybody wants to strike an impression with different and fashionable clothes. But the sad fact is that the human greed to look appealing and wear glamorous clothes has ended up causing harm to the environment. The textile industry is one of the most pollutants releasing industries of the world. Surveys show that nearly five percent of all landfill space is consumed by textile waste. Besides, 20 percent of all fresh water pollution is made by textile treatment and dyeing.

**Keywords:** *textile industry, dyes, environment, pollution*

### **INTRODUCTION:**

Environmental pollution is one of the major concerns of the day. Textiles being one of the basic necessities of the human being cannot be done with even though textile industry contributes almost one-third to total pollution. Lot of work, projects have been carried out to minimize the pollution caused by it but still lot needs to be done and if the efforts are from base level where in each and every individual can contribute it will be more effective.

Color is an important aspect of human world. We like to wear clothes of all kinds of colors and hues, eat food decorated with colors, even our





medicines are colorful. No wonder then, that a lot of research has gone into the production of color. Today there are more than ten thousand dyes available commercially and seven lakh tons of dyes are produced annually (Zolinger,1987). Dyes can be of many different structural varieties like acidic, basic, disperse, azo, anthraquinone based and metal complex dyes among others.

The textile industry is the largest consumer of dye stuffs. During the coloration process a large percentage of the synthetic dye does not bind and is lost to the waste stream (Weber & Adams, 1995). Approximately 10-15% dyes are released into the environment during dyeing process making the effluent highly colored and aesthetically unpleasant.

Pollutants released by the global textile industry are continuously doing unimaginable harm to the environment. It pollutes land and makes them useless and barren in the long run. Surveys show that cotton consumes the highest amount of harmful pesticides and fertilizers. Majority of them fall on land while they are sprinkled on the crop. Similarly, textile manufacturing units release hazardous waste into the nearby land.

The textile industry uses millions of gallons of water every day. The problem does not rest in the high usage, though! The waste is not treated to remove pollutants from it before it is disposed to water bodies. There is no doubt to the fact that the textile industry releases harmful pollutants into the atmosphere in large quantities. It is agreed all over the world that textile industry is one of the most pollutants emitting industries of the world. Almost 2000 different types of chemicals are used in this industry. It consumes as well as contaminates fresh water. There is a need to take actions in this direction, urgently.

No matter which dyeing technique is used, natural or synthetic, water is required to complete the process. In order for water to be usable, it must be purified. Depending on the source of the water, it may contain an excess of carbon dioxide, bicarbonates, sulphates and chlorides of calcium, magnesium and sodium. Water can be identified in the three following broad categories: Well or spring waters, moorland waters, and surface waters. Well water is usually clear and of constant composition. It may have some





sodium bicarbonate, bicarbonates of calcium, magnesium, and iron, as well as free carbon dioxide. Moorland water may be tinted and somewhat acidic.

The color and acid in this water is from organic materials. The acidity and some dissolved gases may make this water corrosive. It may contain calcium chloride, magnesium chloride, and sulphates. Surface water contains sulphates, chlorides, calcium bicarbonate, and magnesium bicarbonate as well. These impurities must be removed to the limits of suitable water quality (Peters, 1967). After water is treated for turbidity and color, iron and manganese, alkalinity, and hardness of water, it can be used in textile mills.

Dyes lead to number of environmental & health hazards which are as follows:

- The greatest environmental concern with dyes is their absorption and reflection of sunlight entering the water. Light absorption diminishes photosynthetic activity of algae and seriously influences the food chain.
- Many dyes and their breakdown products are carcinogenic, mutagenic and/or toxic to life. Dyes are mostly introduced into the environment through industrial effluents.
- Triple primary cancers involving kidney, urinary bladder and liver of dye workers have been reported.
- Textile dyes can cause allergies such as contact dermatitis and respiratory diseases, allergic reaction in eyes, skin irritation, and irritation to mucous membrane and the upper respiratory tract.
- Reactive dyes form covalent bonds with cellulose, woolen and PA fibres. Certain reactive dyes have caused respiratory sensitization of workers occupationally exposed to them.
- The presence of very small amounts of dyes in the water, which are nevertheless highly visible, seriously affects the quality and transparency of water bodies such as lakes, rivers and others, leading to damage to the aquatic environment.



- The highly toxic and mutagenic dyes decrease light penetration and photosynthetic activity, causing oxygen deficiency and limiting downstream beneficial uses such as recreation, drinking water and irrigation.
- Azo dyes have toxic effects, especially carcinogenic and mutagenic. They entering the body by ingestion and are metabolized by intestinal microorganisms causing DNA damage.

The textile industry has been condemned as being one of the world's worst offenders in terms of pollution because it requires a great amount of two components:

- Chemicals: as many as 2,000 different chemicals are used in the textile industry, from dyes to transfer agents; and
- Water: a finite resource that is quickly becoming scarce, and is used at every step of the process both to convey the chemicals used during that step and to wash them out before beginning the next step. The water becomes full of chemical additives and is then expelled as wastewater; which in turn pollutes the environment:
  - by the effluent's heat;
  - by its increased pH;
  - and because it's saturated with dyes, de-foamers, bleaches, detergents, optical brighteners, equalizers and many other chemicals used during the process.

Traditionally produced fabrics contain residuals of chemicals used during their Manufacture chemicals that evaporate into the air we breathe or are absorbed through our skin. Some of the chemicals are carcinogenic or may cause harm to children even before birth, while others may trigger allergic reactions in some people. According to a June 5, 2005 article in Business Week, the population that is allergic to chemicals will grow to 60 percent by the year 2020.

The theory of **4 'R'** i.e.

**Reuse,**  
**Recycle,**





**Refuse** and

**Reduce**, established by environmentalist has been successful to some extent. The least expensive and least adverse effect on the environment is when a component can be recycled into its original product.

**Conclusion :**

It was concluded that the synthetic textile dyes represent a large group of organic compounds that could have undesirable effects on the environment, and in addition, some of them can pose risks to humans. The increasing complexity and difficulty in treating textile wastes has led to a constant search for new methods that are effective and economically viable. Natural dyes are found eco friendly, more useful and cost effective, harmless with soothing effects. They are non toxic, non allergic to skin, non carcinogenic, easily available and renewable. We should use natural dye cloths to make these practices popular in society. So, that plant production may be increased in future which will be beneficial for environment. Although natural dye cloths are costlier than synthetic ones, but they can be made cost effective in coming days by more production of dye yielding crops on large scale with cheaper techniques of dyeing. Thus natural dyes are beneficial :

1. to save environment by large scale production of plants
2. to human society for safer and harmless life
3. to reduce pollution problems by synthetic dyes

However, up to the present moment, no efficient method capable of removing both the color and the toxic properties of the dyes released into the environment has been found

**References:**

- Creating Consumer Awareness By Reuse Of The Textiles By: Dr. Madhu Sharan And Rinku Aggarwal (fiber2fashion.com)
- Natural Dyes : Their Sources And Eco Friendly Use As Textile Materials By: Iqbal Sanjeeda And Ansari Taiyaba N.(Journal of Environmental Research & Development Vol 8, No. 3A, Jan-March 2014)





- Pollution Due To Synthetic Dyes Toxicity & Carcinogenicity Studies And Remediation Ratna, Padhi. B.S. (International Journal of Environmental Sciences Vol 3, No. 3 2012)
- Reducing The Environmental Impact Of Textile Dyes Containg Wastewater By Photocatalytic Degradation With Zincoxide Nanocoated Fibers Coman, D[Iana]; Vrinceanu, N [Arcisa] & Popovici, E[Veline] (Annass& Proceeding of DAAAM International 2011)
- Textile Dyeing Industry an Environmental Hazards –By, Rita Kant, Journal of Natural Science Vol, 4 No. 1, 22-26, 2012
- Textile Dyes: It's Impact on Environment & It's Treatment, By- Sucharita Arora, Open Access Journal- Bioremediation & Biodegradation 2014
- Textile Dyes: Techniques And Their Effects On The Environment With A Recommendation For Dyers Concerning The Green Effect (Thesis By Charity Goetz 2008)
- Textile Dyes: Dyeing Process And Environmental Impact( Chapter 6, Farah M.D. Chequer et.al.)(<http://dx.doi.org/10.5772/53659>)
- Textile Industry Poses Environmental Hazards [www.google.com/BusinessWeek](http://www.google.com/BusinessWeek), June 5, 2005.
- Various Pollutants Released Into Environment By Textile Industry By: [Fibre2fashion.Com](http://Fibre2fashion.Com)

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