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Impact of Textile Industry on Environment

Prof. Neelam J. Mehta*

Environment is a burning and very sensitive issue today. Environment is the sum total of conditions that surrounds us at a given point of time and space. It is comprised of the interacting systems of physical, biological and cultural elements which are interlinked both individually and collectively. Environment is the sum total of conditions in which an organism has to survive or maintain its life process. It influences the growth and development of living forms. Thus it is very important for any living thing

To survive.

In the course of time with the development of science and technology many such activities were undertaken that damaged the environment. Industrial development is one of them generating more pollution. Textile industry is one of them.

Textile industry is one of the major industries. Textiles in any form is an essential part of human life. Clothes is one of the basic necessities of life. One cannot do without clothes. With the development of civilization and science and technology more and more textile mills are being established. We like to wear fancy clothes but are we aware of the damages of its manufacturing process to the environment and human health. In the name of new inventions we are ignoring its effect on environment. We knowingly close our eyes on this aspect.

No matter the Textile industry is very essential in today's world but it is also posing great threat to our environment. It is also one of the causes of air and water pollution. This industry uses plenty of water, chemicals and fuel at almost every stage of its production. Textile processing also adds to pollution by discharging liquid, gaseous and solid wastes which is hazardous to living beings.

One of the main reasons for textile pollution is that the demand for textiles and clothing is changing day by day due to new fashion. Public demand is for fancy clothes with different colour combinations designs and patterns that requires different processes resulting in more pollution. There is lot of variations in textiles today. In some only one fibre is used whereas in others blends are used to improve the quality and appearance of the fabric, to create variety and also to lower the cost.

The textile industry deals with many types of fibres. These are natural fibres i.e. Vegetable, animal and mineral, manmade fibre like Rayon and synthetic fibres like nylon, polyester and acrylic etc. The manufacturing process of each fibre has its impact on the environment.

Cotton - The cotton fibre is the major fibre used in textile and clothing industry. Right from the farming of cotton pesticides are used to yield good crop and protect the flowers and pods. Due to its harmful effect many people die every year.

*Prof. Neelam J. Mehta , H.R. Shah Arts & Com College, Navsari

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These chemicals don't washout and remain in the fabric itself and during the lifetime it is omitted. After that in each and every stage mainly dyeing, printing and finishing chemicals are used. These chemicals damage the environment and human health. Textiles machinery causes noise pollution as well as air pollution. Cotton farming uses 22.5% of all the insecticides used globally. Also bleaching and dyeing creates lots of pollution, Growing cotton for one shirt requires 257 gallons of water.

Nylon and polyester – These synthetic fibres are made from petrochemicals, these synthetics are also non-biodegradable. Nylon manufacture generates nitrous oxide, a greenhouse gas 310 times more potent than carbon dioxide. Production of polyester uses large amounts of water for cooling, along with lubricants which can become a source of contamination.

Rayon - Rayon is a manmade fibre which has its source in nature that is wood pulp and cotton linters and the fibres are made chemically. Forests are often cleared for pulpwood plantations. Often the tree planted is eucalyptus, which draws up large amounts of water, causing problems in sensitive regions. To make rayon, the wood pulp is treated with harmful chemicals such as caustic soda and sulphuric acid. The use of rayon for clothing is contributing towards deforestation. In most of the cities where textile industry is situated the pollution generated is high. In Gujarat also Surat has great noise, air and water pollution. Even the odours emitted are unbearable. The effluents released in the nallas, river and canals has contaminated the water. The colour of water has changed to dark brown at places. Also it stinks. Same problem is there in Ahmedabad and Vapi.

Types of Pollution emitted by Textile Industries

1 **Air**
in textile
produce
generates
health. This
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of pollution to



pollution:- - Boilers are the main source of air pollution industry. Most processes performed in textile mills atmospheric emissions. Gaseous emissions pollution that is harmful to environment and is known fact that textile mills spread air pollution but readily available. Air pollution is the most difficult type sample and test.

Textile mills usually generate nitrogen and sulphur oxides from boilers. Other significant sources of air emissions in textile operations include resin finishing and drying operations, printing, dyeing, fabric preparation, and wastewater treatment plants. Hydrocarbons are emitted from drying ovens and from mineral oils in high-temperature drying/curing. These processes can emit formaldehyde, acids, softeners, and other volatile compounds. Residues from fibre preparation sometimes emit pollutants during heat setting processes. Carriers and solvents may be emitted

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during dyeing operations depending on the types of dyeing processes used and from waste water treatment plant operations.

Carriers used in batch dyeing of disperse dyes may lead to volatilization of aqueous chemical emulsions during heat setting, drying, or curing stages. Acetic acid and formaldehyde are two major emissions of concern in textiles. Oil mists along with acid mists are also produced and emitted in the air. Most common source of oil mist emission is stenter frame. Acid mists are generated during wool carbonization. These mists are corrosive. During dyeing and printing operations chemicals are used in various concentrations which release toxic vapours. These compounds include kerosene or mineral turpentine oil, formaldehyde, ethyl acetate etc.

It also releases bad odours which is released from chemicals used in polyester dyeing, resin finishing, dyeing of cotton, discharge dyes and Sodium hypochlorite bleaching.

Lint and dust is released during various processes of cloth making like in preparing, carding, spinning etc. It is also released during many finishing processes. This problem occurs in natural and synthetic staple fibres

2 Water Pollution – Textile manufacturing process needs chemicals and lots of water at almost all the stages like bleaching and scouring, finishing, dyeing and printing. The chemical has to be washed away from the cloth which also requires lots of water which is disposed through canals in the rivers. Textile industry was releasing effluents in Tungbhadra river. The crystal clear water of the river turned brownish. The textile industry is responsible for 17 to 20% industrial water pollution due to discharge of effluent. This water was tested. 72 new toxic chemicals have been found in it. Out of which only 42 could be removed. On average, approximately 200 litres of water is required to produce 1 kg of textiles. The large volumes of wastewater generated also contain a wide variety of chemicals, used throughout processing. These can cause damage if not properly treated before being discharged into the environment. Of all the steps involved in textiles processing, wet processing creates the highest volume of waste water. Most textile dyes have low aquatic toxicity. On the other hand, surfactants and related compounds, such as detergents, emulsifiers and dispersants are used in almost each textile process and can be an important contributor to effluent aquatic toxicity.



Solid Waste Pollution:- The primary residual wastes generated from the textile industry are non-hazardous. These include scraps of fabric and yarn, off-specification yarn and fabric and packaging waste. There are also wastes associated with the storage and production of yarns and textiles, such as chemical storage drums, cardboard reels for storing fabric and cones used to hold yarns for dyeing and knitting. Cutting room waste generates a high volume of fabric scraps, which can often be reduced by increasing fabric utilisation efficiency in cutting and sewing.

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Effects of Textile pollution.

- 1 Pesticides used can harm living beings and contaminate the land.
- 2 Can harm human health.
- 3 Can raise skin problems.
- 4 Can cause limb deformity
- 5 Causes allergies
- 6 Cause lung diseases
- 7 Causes noise pollution resulting in deafness in the long run.
- 8 Causes air pollution and emits bad odour.

Some Major Acts for Various Discharges to Environment

- 1 The Water (Prevention and Control of Pollution) Act, 1974
- 2 The Water (Prevention and Control of Pollution) Cess Act, 1977
- 3 The Air (Prevention and Control of Pollution) Act, 1981
- 4 The Environment Protection Act, 1986
- 5 The, Manufacture, Storage and Import of Hazardous chemicals rules, 1989
- 6 The Environment Audit Scheme, 1996
- 7 The Environment Public Hearing Rules, 1997
- 8 Utilization of Fly Ash – Notification of Directions, 1999
- 9 The Noise Pollution (Regulation and Control) Rules, 2000
- 10 The Environmental Clearance (including EIA-Environment, Impact Assessment) for expansion/ modernization of activity or new projects Procedure Notification, 2006
- 11 The Hazardous Waste (Management and Handling) Rules, 2008

What should be done?

There is awareness about the hazards of textile industry. So ways have to be found to lessen it.

One way is producing Eco- Friendly Textiles – These textiles are made using organic raw materials. For ex. Cotton, which is grown using organic fertilizers and without using pesticides. Silk is made from worms grown on organic trees. In the course of their production no harmful chemicals and dyestuffs are used. These textiles are usually made from reused and recycled textiles. Other examples of these fibres are organic wool, soya silk, milk silk, Pina (pineapple fabrics), Hemp, Banana, Bamboo etc.

This industry is still at its beginning stage. This is the responsibility of textile manufacturers to promote and encourage it. Also the responsibility lies with consumers to buy eco-friendly clothes and encourage their production and contribute towards healthy environment.

Many Organisations have started to take steps. TRAIID, Marks and Spencer, A.K.A M&S is just one of the large organisations which is trying to contribute towards the

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environment. Few years ago a worldwide renowned store opened eco-factories in Sri Lanka. They have also installed solar panels which now supply 10% of the overall energy. Every part of the building has been developed to reduce the negative environmental impact. The factories use 40% less electricity than all other similar factories. Marks and Spencer has provided the workers natural lighting, fresh air and beautiful view to increase the production.

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