

Environmental Issues of Textile Units at Tirupur



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Tirupur is the largest and fastest growing city in Tamil Nadu. It is the Seventh largest city in Tamil Nadu. It has grown as a 'Municipal Corporation' and is the Headquarter for the newly formed Tirupur District. It is the 32nd District of Tamil Nadu and one among the ten well industrialized and economically developed districts of Tamil Nadu. It had attracted the attention of both the policy makers and businessmen at the national and international levels, mainly because of its continuous business growth and its outstanding performance. It is popularly known as "Banian City" of the South India. The Knitwear industry which is the soul of Tirupur has created lakhs of jobs for all class of people.

District Abstract

Area	5106 Sq.Km.
Population	19,17,033
No. of Talukas	6
No. of Municipalities	6
No of Corporation	1
No. of Parliamentary Constituencies	5
No. of Assembly Constituencies	8

Tirupur is the knitwear centre of India. Predominantly and export niche, the town gains its significance for its updated technology and the quality of its macro economic environment. Buyers from more than 50 countries frequently come to Tirupur. More than 80 per cent of India's total knitwear exports originate from here. The composition of the knitwear industry in Tirupur today is broadly classified as:

Knitting and Stitching units	5000
Dyeing & Bleaching units	733
Printing units	350
Embroidery units	175
Others (Compacting, raising Calendaring)	300
Total	6558

Environmental Problems

Tamil Nadu textile city Tirupur, which has nearly 733 dyeing units, is ranked topmost in terms of generating hazardous waste. The bleaching and dyeing units use large quantities of water, but most of the water used by these units is discharged as effluents containing a variety of dye and chemical (acids, salts, wetting, agents, soaps, oil etc.). These units discharge nearly 90 mld of effluents on land or into the Noyyal River, leading to contamination of the ground and surface water and soil in and around Tirupur and downstream.

There is large number of mechanical, thermal and chemical processes involved in the textile industry and each process has a different impact on the environment. This impact starts with the use of pesticides during the cultivation of natural fibres.

During the past few decades the awareness regarding environmental problems has increased considerably and has become an important issue in the textile trade due to various environmental and health legislations, and also environmental policy is increasingly dictated through market forces. Many chemical used in the textile industry cause environmental and health problems. These problems may occur during the production process, with respect to emissions or occupational health problems. Other problems caused by these chemicals appear due to their presence in the final product. However, worldwide environmental problems associated with the textile industry are typically those associated with the water pollution caused by the discharge of untreated effluent and those because of use of toxic chemicals especially during processing. These chemicals can harm consumer if retained in the fabric.

The textile industry is facing challenges due to social and environmental compliance issues from US and European buyers. Textile processing is a water intensive process. The waste water generated by the industry is high in BOD, COD, pH, temperature, color, turbidity and toxic chemicals. These polluted effluent need to be treated chemically to remove the hazardous material and chemicals so that the waste water will comply with the prescribed limits and can be discharged into the public sewer or into aquatic bodies.

Impact of Colorants on the Environment

Environmental problems associated with the textile industry are typically those associated with water pollution caused by the discharge of untreated effluent. Effluent are generally hot, alkaline, and strong smelling, and colored by chemicals used in coloring process. Some of the chemicals, including dyes and pigments, are toxic or can lower the dissolved oxygen content of receiving waters, threaten aquatic life and damage general water quality downstream.

Impact of Noise

The noise level resulting from the machines used in the textile industry, especially from the dry processes, may violate the limit allowed by the law and cause hearing problems. The ring spinning machines, Knitting machines, the winding machines, the looms, the sewing machines etc. work at very high speeds, thus exceed the allowed level of noise (90 decibels) and cause hearing troubles to the production workers.

Impact of Air

The textile and apparel industries also release waste in the form of air emissions. However, the amount of polluted air produced is relatively small in comparison to other manufacturing industries. Small amounts of waste are emitted at various stages of production, each stage releasing a different type of emission. Due to the high number of manufacturing stages, there are many different types of air pollutants generated by these industries, it is usually difficult to control and measure air pollution.

Impact of Water

Tamil Nadu Pollution Control Board, an estimated 8, 33,365 tons of hazardous waste is generated every year in Tirupur. It discharges nearly 90 million liters of effluent water containing bleaching

powder, Sulphonic dyes, Chemicals and other inorganic catalysts. These are dumped into the Noyyal River or in the open waste land.

The entire Tirupur depends on Bhawani River, which is just over 60 kilometers from the textile city. The city's ground water has been contaminated by the hazardous waste and immediately should find a solution to solve this problem, otherwise not only Tirupur but this contamination will spread over to nearby areas.

The discharge of untreated effluent has already damage over 80,000 acres of farmland along the Noyyal River. It has also brought a decline in the yield of crops like turmeric and bananas.

Typical characteristics of waste water from Bleaching, Dyeing units in Tirupur

Parameters	Bleaching	Dyeing
PH	10	9.5
Biological oxygen Demand (mg/L)	300	380
Chemical Oxygen Demand (mg/L)	650	700
Total suspended solids (mg/L)	300	350
TDS (mg/L)	6560	9000-10000
Color	Whitish	Intense color

The bleaching and dyeing units in the textile industry have caused severe environmental pollution problems. While the government has passed different laws for controlling pollution, the major enforcement agency, the State Pollution Control Board (PCB) has not been able to implement the pollution control measures effectively, due to the large number of small units. The bleaching and dyeing units use a large quantum of water. Most of this water is discharged in the form of effluents into land and water polluting the local environment. However, these industries provide substantial employment and income to the region and foreign exchange to the country. Considering these facts, there is need for develop an appropriate strategy for balanced development.

The total water consumption by these units in about 90 mld while the water used per kg of cloth processed is 144 liters. The water consumption per kg of cloth processed has declined from 226 liters in 1980 to 144 liters in 2000, possibly due to the non-availability of local water due to the

textile pollution. The total annual water cess collected by the PCB from the 733 units is Rs.29.42 lakh at an average of Rs.4010 per units. The water cess provides some revenue to the Board, but does not act as a disincentive either in the use of water or the discharge of waste water.

All the polluting units are required to meet the effluent standards of the Pollution Control Board. For the smaller units, the cost of effluent treatment may be as high as the existing capital investment for production. These units have to either close down or utilize a common effluent treatment plant (CETP). Others who can afford their own facilities have to set up their individual effluent treatment plants (IETP) if they are to meet the standards.

The discharge of effluents has caused severe pollution of both the surface and ground water in the region and has also contaminated agricultural land. Due to pressure from NGOs and farmers organizations through the High Court, the PCB (Pollution Control Board) has insisted that the units should either connected to a CETP (Common Effluent Treatment Plant) or should have their own treatment plant. As a result 147 units have constructed IETP (Individual Effluent Treatment Plant) and 496 units are connected to 20 CETP (Common effluent treatment plant) in Tirupur. Around 90 units which were not connected either to CETPs or IETPs have been closed down by the order of the High Court. Even though the units are treating their effluents through CETPs or IETPs, the treated effluents do not meet some of the standards prescribed by the TNPCB especially for parameters like TDS and Chloride.

According the PCB rules, all the dyeing & processing units should be situated 1000 meters away from a river / stream or any other water resource. However, in Tirupur, as far as information gathered from PCB records, around 239 units are located at a distance of less than 300 meters from the Noyyal River. So, there is high possibility for polluting the river. Around 83% of the IETPs discharged their effluents directly /indirectly in to the water bodies. It shows that there is a high possibility of pollution accumulation.

Recently, in January 28, 2011, High court ordered to close all the dyeing and bleaching units based on the case filed by Noyyal River Ayacutdars (farmers) Protection Association seeking to punish the authorities concerned for not obeying the court's earlier orders dated December 22, 2006 and April 28, 2003. The Tamil Nadu Pollution Control Board and the monitoring committee constituted by the HC will conduct inspection at the treatment plants to ensure proper zero liquid discharge

and certify the system. After the committee gives the necessary certificate, the dyeing units can be opened.

More than 15 years, they are facing this problem of effluent discharge. In 2005, as advised by the Anna University and the Indian Institute of Technology in the state, the industry set up a system, where 80 per cent of the water was cleaned through a reverse-osmosis system and 15 per cent through multiple evaporators. The remaining five per cent was a problem. “But in recent days, the multiple evaporator system concepts have also started failing. Now they don’t have any technology for zero discharge.

The estimated loss from closure of these units is expected to be around ₹10 crore every day. The Tirupur knitwear industry, which depends on these units, is expected to report a loss of around ₹42 crore daily & the export order will get delays and possibility of cancellations if dyeing units are closed. Also they can not take new order until the dyeing unit problem solved.

Suggestive Measures To Overcome The Environmental Pollution

Textile and leather industry directly or indirectly contributes 60 per cent of pollution. Basically, textile industries use maximum amount of water compared to other industries and that is used in wet processing of textiles. In textile, water is the medium for application of dyes, chemicals and various finishes on to the textile substrate that is quite abundant and cheaply available in nature. After processing, the unit discharge effluents contains large amount of impurities. Direct draining of contaminated water to the environment affects surface water sources, ground water and soils, which ultimately affects the livelihood of human beings. Sometimes, low financial and absence of new technological method generates waste water after textile processing.

1. So before discharging effluents to the environment, they need to be treated in such way that the pollution load on to the environment gets reduced. Further these treatments are carried out in such a way that waste water can be reused not only for industrial purpose but also for domestic purpose. A water recycling system could be installed in each dyeing unit.
2. Biological treatments can be used to reduce the COD (Chemical Oxygen Demand) of textile effluents. Instead of using the chemical treatments, various biological methods

can be used to treat the waste water from the textile industry. These methods include, bio-sorption, use of enzymes, aerobic and anaerobic treatment etc.

3. Apart from this, biotechnological solutions can offer complete destruction of the dye stuff, with a co-reduction in BOD (Bio chemical Oxygen Demand) and COD (Chemical Oxygen Demand). In addition, the bio-technological approach makes efficient use of the limited development space available in many traditional dye house sites.
4. The best way to reduce the impact of dyes and chemicals on the environment is by reducing the amount of waste water released for treatment.
5. Replace process chemicals having high pollutant ratio or toxic properties with other chemicals that have less impact on water or that are more amenable to waste water treatment.
6. Use latest textile processing equipment which can operate with lower chemical and water usage.
7. Before granting permission, the government should insist the textile unit owners to install effluent treatment plant. The designing of effluent treatment plant involves performing repetitive calculations which take considerable time and energy and there are chances of human error. All this can be avoided by using software for designing the effluent treatment plant.
8. In Tirupur small, medium and big processing units are there, so it is not economically viable to all units to adopt latest technology. Government should form a committee comprising Tamil Nadu Pollution Control Board, Dyers Association, Textile Committee, Technology Provider and the farmer & take suitable corrective & preventive action to resolve the problem of pollution.