



A STUDY ON ENVIRONMENTAL PROBLEMS AND ITS IMPLICATION ASSOCIATED WITH THE TEXTILE PROCESSING UNITS AND PRESENT STATUS INTIRUPUR, TAMILNADU

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Abstract

The Environmental Problems due to rapid industrialization and very common in areas were polluting industries like textile processing units. The effluents discharged by these industrial units have led to severely polluted surface ground water sources and soils which has ultimately affected the livelihood of the common man. At present 9000 knitting processing, Manufacturing and allied units are functioning in Tirupur that provide for more than 2 lakhs people and the direct export earnings in 2015 has Rs 26476 crores. One of the most significant problems for the Tirupur textile industry is 'water'. 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 dyes and chemicals to the noyyal river. Until the Government of Tamilnadu issued an order for commissioning effluent treatment plans. This study has captured all available data and understood that while a lot has been done to reduce pollution load in water bodies more work needs to be done both in terms of policy and implementation.

Keywords: *Noyyal River, Zero Liquid discharge (Z L D Plant), River water effluent).*

Introduction

Tirupur, a prominent City and district of Tamilnadu state which is famous for manufacturing and export of Hosiery garments. The city has come a long way from a small cotton marketing centre with a few ginning factories to become a prominent cluster of small and medium manufacturing industries gainfully engaged in the production and export arranged of knitted apparels. In addition, availability of raw material and cheap labour has ensured that the textile industry activities here experienced rapid growth in the last two decades. Today almost 80 percent of India's Cotton Knitwear export happen from Tirupur. There are 6.250 units involved in various operations of the textile industry in Tirupur. It has 4900 knitting and stitching units, around 736 dyeing and bleaching units 300 printing units, 120 embroidery units etc. This town annually contributes about INR 12,000 crores (Rs. 120 billion) in foreign exchange earning to our country, besides, an earning matching or surpassing the above figure to cater the domestic market.

Industrial Effluent: Problems

The Industrial effluent by dyeing and blessing industries in Tirupur has become a serious issue. In textile processing, 'bleaching and dyeing' are the two major activities that require a large amount of water. However, these activities are non-consumptive and most of the water used by these units are discharged as effluent after processing. For the last two decades the dyeing units are located in and around Tirupur have polluted the 'Noyyal River' a non-perennial river that ends in the Cauvery, near Karur by discharging the toxic effluents into the river.

Hence, the industrial effluent released by dyeing and bleaching factories in Tirupur has become a serious issue. At present, there are around 800 dyeing and bleaching units in Tirupur. Due to industrial pollution, the adverse impact is severe on agriculture, fisheries, human health and live stock it has become the need to study on the impact of industrial effluent on agricultural and other issues.

Dyeing Process

Dyeing is the application of colour to the cloths. There are many classes of dyes, for example, vat dyes, developing dyes, naphthol dyes, natural dyes, etc. The water requirement for dyeing varies between 36-176 liters/kg with an average of 106liters. The effluent generation during dyeing process is slightly lower than the water intake and its between 35 to 175 liter/kg with an average of 105liters.

The dyeing process is as follows; The bleached material and water is loaded into the winch along with the required quantity of dye stuff (varying from 0.001% to 10% as per the color and quality required) common salt (about 40 to 120% of the weight of material is added to dye bath) depending on the shade required Sodium carbonate (4-22% of the material weight) and caustic soda (1-3%) are also added and the which is operated at 80°C for 1-3 hours. The material is then washed with fresh water for half an hour and the whole process is repeated. Next the detergent is added to the winch and followed by 5-10% Hydrochloric acid treatment for neutralization. The material is washed twice before adding dye-fixing agent (about 1% of the weight of material). The material has washed after each operation. All the waste water has transferred to the treatment unit and then to the "Noyyal River".

Environment Problems of Textile Processing

The environmental problems of these industries are leading to loss in crop area and production, changes in cropping pattern, affect on ground water, health problems and socio-economic imbalance in the region.

Following are the major impact arises due to effluent of textile processing in Tirupr.

- **Impact on Orathuppalayam Dam:** The NoyyalOrathuppalayam Dam and Reservoir also called the Orathuppalayam Dam. the Dam has located on the Noyyal River between Chennimalai and Kangeyam in the Tirupur District, Tamilnadu. The Dam was built in the year 1992, it has an ayacut of over 10000 acres in the Tirupur and Karur districts. The dam has used by the farmers only for five years as it become a storage tank for textile effluents after that, the farmers who depended on the dam and river irrigation stopped the farm activity in their dam.
- **Impact on Ground Water:** Water levels in the borewells are lowering due to the large scale exploitation of ground water for industrial application. Also, the quality of water is poor from the deeper aquifers especially the TDS & TSS parameters. Generally, the water is not suitable for the textile industry and for drinking. The depth of borewell in Tirupur area varies from 1000 to 1200 feet.
- **Impact on Land:** The continuing disposal of partially treated or untreated textile effluent either into the river or on the land has resulted in the soil being concentrated with salts and unfit for agriculture. Farmers have resorted to the very short sighted and interim livelihood solution of sale of water (instead of tilling the land)
- **Impact on Agriculture:** Agriculture sector was the major sector which bore the brunt of the impact of pollution in the form of decline in yields. Agricultural yields depends upon many factors like seeds, weather, soil fertility, irrigation, manures, fertilizers and pesticides used etc., Other things are remaining the same, water pollution and soil pollution mainly caused a significant fall in crop yield. Normally, the entire water used in the process of dyeing and bleaching is discharged as the chemical effluents. The biggest pollutant in the effluent is heavy metals. This effluent from the dyeing and bleaching units from Tirupur, is let out into the open, without any treatment or semi treatment. The dyeing and bleaching industry has not only ravaged the land but has also upset the intricate biological food chain of the area. The damage caused due to effluent discharge on agriculture is estimated to be Rs. 234.54 crores.

The abandoning of agriculture lands in effluent affected and not affected villages has presented in the table.1. In the Noyyal river effluent affected are only 35.91 percent of the agriculture lands are under cultivation remaining 64.09 percent lands are abandon or follow land. In the Noyyal River effluent not affected area 94.08 percent of the agricultural lands are cultivated remaining only 5.92 percent lands are abandon or follow land. It is clear from the table that effluent affected area the abandon lands size is higher than effluent not affected area.

Table 1: Abandoning of agricultural lands (In acre)

Nature of Land	Effluent affected villages	Effluent not affected villages
Cultivated	109 (35.91)	313.5 (94.08)
Abandon	194.5 (64.09)	26 (5.92)
Total Land	303.05 (100)	339.5 (100)

- **Impact on Fisheries:** The fish mortality at Orattupalayam reservoir has compelled the Fisheries Department to stop fish culture here. Both the ground water and the surface water are unfit for consumption. They have to walk long distances to fetch potable water.

Effluent treatment and Zero Liquid Discharge (ZLD) : Present Status

Realizing the seriousness of the textile effluent pollution, the court gave an order against the functioning of polluting units without effluent treatment plants in 1997. After that the state pollution control agency put more pressure on all the units towards effluent treatment, 164 units were closed. Presently out of the 736 units, 278 units are treating 38 MLD of effluents through 20 common effluent treatment plants (CEPTS) and more than 400 are treating 45 MLD of effluents through Individual Effluent Treatment Plants (IETPs) For effluent treatment, USD 10 million was spent for fixed costs, which are highly subsidized by the Government. In the recent budget the Government proposed to provide a one-time grant of Rs.300 crore allotted to the cost of installation of a zero liquid discharge system and the money has issued to the Tirupur Corporation.

After treatment they use the treated effluent on land of irrigation in their own land. The remaining medium and small scale units (493) who have not adequate land and finance to provide, IETP, they have joined together and formed company. Through the company they executed 8 Common Effluent Treatment Plants (CETP) with 50% financial subsidies from

Central and State Governments. The treatment system generally consist of collection well, equalization tank, flash mixer, clariflocculator aeration tank, clarifier, pressure sand filter, sludge thickener, centrifuge, and sludge drying beds. After treatment the treated effluent was discharged into river Noyyal.

Zero Liquid Discharge (ZLD)

In Tirupur, attempts to implement ZLD began in 2010 when existing treatment plants were upgraded and new ones set up. At present, there are 20 common effluent treatment plants to achieve ZLD, secondary treated waste has passed through membrane filters. The filter reject, or reverse osmosis (RO) reject, has evaporated so that no pollutants are discharged in the open. The evaporators in the CETPs are not efficient and cannot deal with the quality of effluent supplied. For this reason, dyers claim, they had to cut production to comply with the courts order on ZLD.

The concept of ZLD emerged because the industry has repeatedly failed to meet the pollution discharge norms set by the Central and State Pollution Control Boards (CPCB and SPCBs) says S.Eswaramoorthy of Private firm ECP consulting, in a paper on the subject. Till recently, SPCBs either issued show cause notices or penalized polluting units. "There has been a realization that the present monitoring mechanism has failed to check the incessant discharge of waste water. Says DD Basic, incharge of pollution, assessment, monitoring and survey in CPCB.

Conclusion

The use of the untreated effluent water from the Noyyal River basin for the irrigation of Crops created adverse impact on the farming lands, as well as it increases pressure on environment by damaging the ecology.

The above analysis reveals that the economic base of the knitwear industry in Tirupur region along with the magnitude of environmental damage and the inefficiency in existing pollution management efforts. At one stage it was assumed that installation of effluent treatment plants would solve the problems. But this did not happen because plants are not designed to remove TDS. Recently, the pollution problem caused by the industry has been of concern to overseas buyers and consumers and their future reaction may be a big challenge too. Anyhow it is a hard time of come up with some solution for the pollution problems in Tirupur.

The current practice of water usage, effluent treatment and discharge and sludge storage and disposal is not sustainable and would cause irreparable damage to the ecosystem while threatening the livelihoods of the farmers in the vicinity of the textile units.

Suggestions to Eradicate the Pollution Problems

- In the Noyyal River effluent affected village farmers suggested that to stop effluent discharge in the river the supreme court order must be implemented.
- The dyeing owners suggested that Government along with providing subsidies should ensure faster implementation of these effluent plants to reduce the further effects.
- Government has started to clean the Noyyal River and Orathuppalayam which is a good to city and the help the farmers but it has to be done faster.
- There is need to introduce cleaner technology to reduce the pollution load.
- Reverse Osmosis has been identified as a technologically suitable option for treating textile industry effluent from large and medium sized units. However no technology option seems to be forthcoming for effluent treatment from small units. This problem would become acute and there has to be technology development effort now for technoeconomically viable options to emerge in the near future.

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