

## **DIRTY SHIRTS**

A study of health, safety and, environmental concerns in the context of the garment industry in Tirupur region, India

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## **Summary of the Report**

The aim of this study is to identify the health, safety and environmental concerns of textile and garment production in Tirupur region, India. The study concentrates on suppliers working for Dutch garment retailers, mainly daughter companies of a major Dutch brand and these suppliers also working for other European and North American brands.

Sixteen factories (in the field of textile dyeing, textile bleaching and garment production) have been investigated by means of interviews with factory owners, trade unions and workers about health and safety issues. In order to investigate the quality and effectiveness of wastewater management in the textile industry the research also includes water sample analysis. Water samples have been collected from surrounding rivers, wells and common effluent treatment plants. Also farmers in surrounding villages have been interviewed about the quality of water for consumption, household and irrigation.

The study concludes that textile bleaching and dyeing production processes are a serious threat to human health and the environment in the wider region of Tirupur. The textile industry is responsible for the pollution of air, soil, surface and groundwater. The treatment of waste water insufficient. In the current scenario the population in Tirupur region is dependent on ground water which according to World Health Organization (WHO) standards is not fit for consumption, household and irrigation. Other health and environmental risks are the excessive use of water by the textile industry causing a lack of drinking water and water for domestic and agricultural purpose, and deforestation, due to the use of fossil fuel for boilers in textile factories.

Workers in dyeing and bleaching factories handle chemicals without proper protection measures. They are faced with chronic health problems, skin diseases and hair loss.

The study has focussed on one particular region, in one particular country. However, health and environmental problems put forward in this report not only occur in India, but also in other low cost production countries producing for western markets as well.

The research clearly demonstrates the need for broadening the scope of corporate responsibility within the garment sector. The term 'chain responsibility' of western buyers, like this Dutch Company and its daughter companies, should not only refer to labour issues in the process of stitching, but also to preceding production stages (bleaching, dyeing), including the health and environmental impact of garment and textile production on the surrounding communities.

## I. Introduction

The aim of this study is to identify the health, safety and environmental concerns in the garment and textile production process for selected Dutch garment retailers, all part of the major Dutch company. The study focuses on Tirupur, a city in the south of India, also referred to as 'T-shirt city', due to its core business, export-oriented garment production.

The research is conducted by S.M. Prithiviraj, director of the Indian non-profit organization *Community Awareness Research Education* (CARE), on behalf of the Dutch consumers' organization *Goede Waar & Co.*

CARE is a recently launched organization working on the following subjects:

- ❖ monitoring labour and environmental standards
- ❖ human rights education for special programs for women, children and workers
- ❖ environmental awareness campaigns and actions
- ❖ sustainable development in local communities

The recent study aims to strengthen the campaign, by collecting data about the health and environmental concerns of garment and textile production, with special attention to textile bleaching and dyeing processes.

The perspective of the study adds a new dimension to the term 'chain responsibility'. In discussions about corporate responsibility within the garment sector 'chain responsibility' until now particularly refers to labour conditions during the process of garment manufacturing, i.e. the actual stitching of garments. This study stresses the importance of chain responsibility further down the production chain, such as textile bleaching and dyeing processes.

The findings of this study may strengthen the activities for better working conditions of the suppliers of European and North American companies internal Corporate social and environmental accountability and also its campaign for better working conditions in the entire region particularly on health and safety aspects. The 2001 fire at a Bangladesh garment factory that resulted in the death of 45 workers, highlighted the need for greater attention to health, and safety issues in the garment industry in South Asia. The findings of this study can be used to support efforts to pressure Western with respect to take responsibility for improving working conditions, particularly with respect to health and safety, at the factories that manufacture their goods, and for the environmental impact these companies have on the communities they are located in.

In drawing attention to the failure in enforcing health and safety standards in the workplace and the negative environmental impacts of garment, dyeing, and bleaching operations on the region, this study does not seek to drive these industries out of Tirupur. Instead, by gathering and disseminating this information, it is hoped that companies at the

highest end of the garment supply chain - those Dutch and other European, and North American companies - will live up to their responsibilities to ensure that good standards are met in the workplaces where their goods are manufactured. Because these export-oriented industries are the major polluters in the region, European and North American companies, which play a major role setting workplace standards, should remain in the region and work towards the implementation of standards that demonstrate a commitment to socially and environmentally responsible business practices.

## **II. Research objectives and methodology**

This research project was initiated to focus on health, safety and environmental concerns linked to export-oriented garment export production in Tirupur. Eleven garment manufacturers and five dyeing and bleaching companies that regularly carry out contract work for these manufacturers were selected as the focus of this study. These garment companies produce children's wear for Dutch clients, particularly daughter companies of major Dutch retailer.

### **Research objectives**

The objectives of this research project were:

- to identify health concerns linked to garment and textile production (including stitching, dyeing and bleaching);
- to gather more information about working conditions in the garment and textile production factories producing for major Dutch retailer.
- to identify and analyse the problems related to the management of effluents from dyeing and bleaching industries;
- to identify the environmental impact of these industries on local water resources (river water, lake water, and ground water);
- to identify other environmental problems related with garment and textile production (air and soil, pollution);
- to develop a profile on health and environmental policies, laws and regulations related to this industry and research data from all related institutions<sup>2</sup>.

### **Limitations of this study**

Limitations of the study are mostly related to samples collected in this study considering the magnitude of workers involved in these selected garment companies and farmers facing environment impacts of the dyeing and bleaching industry on the neighbouring region. Given the large size and the vast number of workers employed in Tirupur's garment industry, there were obvious limitations on the number of people that could be interviewed as part of this study.

The same goes for the selection of communities covered by this study. There are numerous villages in the Tirupur region which have been affected by the dyeing and bleaching industries, however only 18 villages were included in this study sample. Therefore, it is possible that conditions in other villages in the region may differ slightly from those reported here. Regrettably, this study was not able to cover the impact of water pollution on villages and farmers in a larger geographical range.

## **A. Interviews**

Interviews were conducted to gather opinions and information on the actual situation in the Tirupur region from a variety of local stakeholders, based either on their involvement in the garment industry or because impacted by the industry. Interviews were conducted with 55 garment company workers. 50 workers at dyeing and bleaching companies:

Five dyeing and bleaching units that process fabrics for the 11 garment companies were selected in this study.

### **10 owners of garment, dyeing, and bleaching companies :**

All 16 owners from the 11 garment factories and the five dyeing and bleaching companies were approached for interviews. Only two of them agreed to be interviewed. In the end, 10 factory owners, including those from other factories, were interviewed for this study.

**12 leaders of all major trade unions** active in Tirupur (6 of them are also major trade unions in all India context)

### **25 farmers living in Tirupur region.**

Farmers selected for interviews were drawn largely from those living in the villages found along the banks of the Noyyal and Nallar Rivers: These two rivers bisect the entire Tirupur region.

## **B. Water sample analysis**

Information for this study was also gathered through the analysis of water samples. Water samples were analyzed based on the Tamil Nadu Pollution Control Board standard of water quality, which includes the maximum permissible limits of total dissolved solids and other chemical elements. Sample data were compared with World Health Organization (WHO) standards on water quality. In order to get an overview of water quality in the area, samples were taken from the following sites:

- **common effluent treatment plants** where wastewater from one of the dyeing and bleaching companies selected for this study was processed;

- **the Noyyal River** at a place after the (waste) water canals from most of the common effluent treatment plants reach the river;
- **a village well** near the Noyyal river after it crosses Tirupur town and travels approximately 8 to 10 km to reach Velliampalayam;
- **the Orathupalayam Dam** (the final destination of Noyyal River);
- a well near the dam, where the decline of agriculture takes place. The decline is due to non-availability of unpolluted water for irrigation.

A detailed report of the water sample analysis can be found in full report.

### **III. Garment and textile production in Tirupur region, South India**

Tirupur, often called T-shirt town, because of its enormous production of knitted garments, is one of India's major export-oriented garment manufacturing centres. The town is located in South India, in the state Tamil Nadu. In the Last ten years, the town and its surrounding villages have grown rapidly in terms of production and population.

The share in knitted garment exports from India is 48 percent in volume and 35 percent in value terms in 2000.<sup>4</sup> In recent years, garment production has also increased dramatically in the towns surrounding Tirupur; the region as a whole is now called the Tirupur belt. Apart from the direct exports from Tirupur, a substantial quantity of garments produced from the Tirupur belt is exported by merchant exporters in Mumbai, Chennai, Delhi and Bangalore, which is estimated as another 25 percent of the total knitted garments in India. Thus, this zone is producing more than half the knitted garments in the country. Garment export revenues reached 70,000 million Rupees (Euro 1479 million) in 2001.<sup>5</sup>

Knitwear is a labour-intensive sector. The Tirupur exporters' association claims that order to meet production targets for local garment companies cheap labour and infrastructure for water and electricity are necessary.

The garment and textile industry has attracted thousands of people from other parts of Tamil Nadu; particularly people from the state's southern region that has been hard hit by drought. Tirupur's population has now reached 0.9 million, and with a growth rate of more than 100 % -one of the largest growth rates ever recorded in India -the population will increase even more.

Migration has not been limited to adult workers. An influx of children from other areas coming in search of work has caused an increase in the number of children living on the streets of Tirupur. Approximately 50,000 workers commute to Tirupur daily from the nearby towns of Palladam, Dharapuram, Kangeyam, Mangalam, Avinashi, and Perumanallur. More than 60% of the entire population in the area lives in the 80 slums located around Tirupur.

With the economic growth that the garment and textile industry has brought, there have also been accompanying social, economic and environmental problems. Living

conditions for most working class people are bad and housing is overburdened by the influx of migrant workers.

Most of the workers in Tirupur region's garment, dyeing, and bleaching industries receive meagre pay, work long irregular hours, and must contend with poor sanitary and health conditions and insufficient safety regulations. Recent price hike in essential commodities (rice, sugar, wheat and milk) and state services such as electricity and transport facilities have had a tremendous impact on their financial situation.

More or less static minimum wages, increasing costs of living, a growing population density and poor health and sanitary conditions are directly linked with the expansion of the town.

The indiscriminate growth in and around the city also has had a tremendous impact on Tirupur's basic infrastructure and the environment. Sewage disposal and other basic amenities currently provided by the local administration were originally designed for a population of only 0.225 million people. Local authorities and the industry have difficulties to manage solid and water waste.

### **Health and safety**

Earlier studies found that Tirupur's garment, dyeing and bleaching facilities do not meet either national or international safety standards. In some companies, even fire extinguishers are not available. At other factories, there are fire extinguishers but workers are not trained to use them. Some companies have emergency exit doors, but garment boxes or tables block them. It seems sheer luck that so far no major fire accident has been reported at a garment factory in this region.

Currently, garment companies are only legally responsible for workplace accidents, not for medical problems that could be workplace related, such as body pain, frequent fevers and colds, and headaches. Workers pay their medical bills themselves. In India in unorganized sectors like the garment industry there usually is no health insurance system, no free medicine, no company dispensaries and no in-house doctors.

Health department officials claim that they have no information about workplace accidents because employers, attempting to avoid media attention or scrutiny by the police, seek treatment for most injured workers at private hospitals.<sup>7</sup> Mainly for this reason, we have not been very successful in documenting specific cases of work-related accidents in Tirupur's garment industry. However, input from garment workers and trade unions does provide an overview regarding the concerns over work-related accidents.

Officially, during the past three years there were 11 work-related accident victims in Tirupur, according to the records of Government General Hospital. But according to one trade union leader, with 30 years of experience, approximately 50 accidents take place every year in this region. Most of them are power table and generator related accidents; only a few are chemical related at dyeing and bleaching units. In the event of a workplace accident that results in the death of a worker, families have been paid 10,000 Rupees (211 Euro).

## **Decline of cotton cultivation**

For the past eighty years Tirupur region has been the cradle of India's textile industry largely because the region has black soil. Black soil is rich in nutrients and supports a quick and quality growth of cotton. Coimbatore region, including Tirupur region, became a major cotton cultivation centre after the richness of the soil was identified under British colonization.

Before British rule cotton cultivation did take place as a one season rotational crop for local consumption. Spinning mills for large scale yarn production were introduced in the early 20th century. Today only 4 percent of the farmers cultivate cotton, while ten years ago 64 percent of Tirupur's farmers grew cotton. This drastic change is due to the fact that water resources in the region have become contaminated and the consumption level of the dyeing and bleaching industries has generated water scarcity. The export-oriented garment industry, and its allied industries, which came into existence due to the availability of cotton, is actually working against cotton cultivation and has caused the region to become dependent on imported cotton.<sup>9</sup>

The decline in cotton cultivation has broken the self-sufficiency of the Indian textile sector in terms of cotton production, despite the fact that India has 25 percent of world's cotton cultivation area (9 million hectares of land).<sup>10</sup>

## **IV. Environmental impacts of garment and textile production in Tirupur region**

The growth of the garment and textile industry was not planned in terms of water utilization, energy consumption, protection measures to prevent water and air pollution, and health and safety measures for workers and the general population. The process of dyeing and bleaching textiles is a problem for the environment because of the intensive use of water and chemicals.

The number of dyeing and bleaching companies in the area had increased steadily, and since the 1980s dramatically. In 1941 there were only two dyeing and bleaching companies in Tirupur, ten years later there were fifteen, and by 1961 there were 42. By 1986 there were 99 dyeing and bleaching companies but by 1989 that number had swollen to 450. The increases continued throughout the 1990s: 518 in 1992 and 713 by 1994. According to the most recent figures (2001) available, there are 800 dyeing and bleaching companies in Tirupur, involved in export-oriented garment production.

The Bhavani River provides water to the Tirupur region. The river's source can be traced back to the Nilgiris Biosphere Region, a 2537 km<sup>2</sup> region, which is undergoing deforestation. The Bhavani's water flow, and that of the adjacent 170 km long Noyyal River which bisects the Tirupur region, are declining due to this factor. Nearly 500,000 residents of the Tirupur region depend on Bhavani River water schemes. In this region, the Noyyal River has been reduced to a mere toxic wastewater canal due to the dyeing and bleaching industries.

## **Water pollution**

Nearly 13 percent of India's average daily emission of organic water pollutants can be traced to the textile industry (both textile and garment production). The Tirupur region, which produces approximately 40 percent of India's produces textile and garment production therefore generates more than 5 percent of the nation's total average emission of organic water pollutants, ranking Tirupur as one of the country's top polluters in this category.

In addition to organic water pollutants, the garment industry in Tirupur is the source of other emissions such as inorganic water pollutants and air pollutants, because of the use of a variety of chemicals in bleaching and dyeing processes. Considering that the average volume of chemicals used per day is 75 kilogram per factory, 800 dyeing and bleaching units use 60,000 kilogram of chemicals per day.

After a decade of public outcry over water pollution in the Tirupur area, which included legal action by environmental groups, in April 1998 the High Court of Madras issued an order to build common effluent treatment plants (CETP) in the area. A month later the state government convened a meeting of representatives of industry, industrial associations, and petitioners to follow up on this ruling. The group decided that 25 percent of the project costs for CETP's at Tirupur and Karur would be carried by the Tamil Nadu State Government. The Tamil Nadu Pollution Control Board (TNPCB) has so far received 194,9 million Rupees (Euro 41 million) from the Government of Tamil Nadu for 38 CETP's. The Union Government of India in December 1999 provided a 157,2 million Rupees (Euro 33 million) grant to cover 25 percent of the project cost. The other 50 percent of the cost were shared by the industries involved in each common effluent treatment plant. The Tamil Nadu Pollution Control Board has forced several dyeing and bleaching companies to set up either individual or CETP's in this region.

Two hundred and forty of the area's dyeing and bleaching companies have jointly started eight CETPs at Kunnangalpalyam, Kasipalayam, Chinakarai, Manickarampudur, Veerapandi, Mannarai, Angeripalayam, and Andipalayam. The cost for constructing these eight plants was Rs. 250 million (Euro 5.28 million), with state and national government covering 50 percent of the cost. There are plans to set up a ninth plant at Chinakarai for 68 dyers from this area. This plant alone is designed to treat 20 million litres of wastewater per day. The cost for this plant is estimated at 400 million Rupees (Euro 8.45 million).

The eight units, with monthly operational cost of approximately 10 million Rupees (Euro 211,283 million), have a capacity of 40 million litres of wastewater per day, that is 5 million litres each. Meanwhile, the total volume of wastewater discharged daily from dyeing units is 80 million litres. The excess 40 million litres of wastewater is treated at all those treatment plants, which is double the size of their capacity. So all the CETP's are operating at double their capacity.

Because the plants operate beyond their capacity it is not possible to meet the quality standards of the TNPCB, as we'll see later on in chapter V (Analysis of the research findings).

Although TNPCB officials publicly demand that zero discharge standards to be met, this is not happening anywhere in the region, due to a lack of capacity, technology and money. Employers and the Federation of Common Effluent Treatment Plants repeatedly demand more governmental subsidies to implement the original plan of constructing a large-scale network of treatment plants to cope with the high levels of discharge.

### **Water supply and demand**

The quantity of water involved in the dyeing and bleaching processes also has an impact on the local water supply, with direct consequences for the rest of the community. The dyeing and bleaching processes consume an enormous amount of water, i.e. 0.15 to 0.2 million litres of water for processing a ton of fabric. This excess water demand puts pressure on other stakeholders such as farmers, who need water for agricultural purposes, and also villagers and urban residents, who need water for domestic purposes.

The groundwater level has dropped, with water available only at 700-1,000 feet in most places. Generally, a dyeing company needs 144,000 litres of quality water per day. The area's 800 dyeing companies are using an average of 115.2 million litres of fresh water per day. This figure includes all those plants without effluent treatment facilities.

Inhaling the foul smell from effluents in the river causes respiratory problems and untreated water damages further the ground water in the wells which are located more than 5 kilometres from the edge of the canals. Water from such partially polluted wells are used for washing purposes. Several people are reported to have skin diseases as an outcome of such use. Over the years, the heavy consumption of water by the dyeing and bleaching companies in this region has affected the environment of the region and the health of the workers who make up the majority of the population.

The industry, including dyeing and bleaching units, purchases water for 75 to 100 Rupees per 12,000 litres when availability is high. Unlike the workers, managers of garment and allied industries, traders involved in these industries, government officials, and other wealthy people purchase quality water for their use. Because of the limited free water supply by the government workers' wages are strained by the need to buy water from commercial water sellers. Transport vehicles with a capacity of 12,000 litre supply water to residential areas, though their main customers are the dyeing and bleaching companies. Most workers buy six-litre pots that cost approximately 1 to 3 Rupees, depending upon demand and availability, while those who can afford it buy larger quantities.

### **New water schemes**

The water requirement of the town of Tirupur is 30 million litres per day, but it receives only 27 million litres every 7 to 10 days from Tirupur Municipality's water distribution

scheme. For the additional water requirement water is drawn from nearby villages where groundwater is not polluted and carried in lorries to the residential and industrial areas.

Since the water demand is more than the capacity of the two existing water schemes there are plans to draw 185 million litres per day under a Build Own Operate Transfer (BOOT) system to cater to the needs of 4,540 garment companies and 800 dyeing and bleaching units in this region. The Tirupur Water Supply Scheme-III involves an estimated 287 million US dollars. The United States Agency for International Development has provided a loan guarantee for 25 million US dollars. Mahindra Infrastructure will manage the project. For the operation of a potable water supply system to Tirupur, water will be extracted from the Cauvery River (which flows out of the Bhavani River) by building a 55-km pipeline.

The project also calls for a 350-km water distribution network, sewage treatment plants pumping stations, and conveyance facilities. The UK-based water giant Bechtel has begun work on the first stage of this project.

### **Air pollution**

Just as with water resources, there have been insufficient safeguards to protect air quality. There are no systematic efforts to control air pollution in Tirupur with respect to the emissions from the dyeing and bleaching industry, automobile emissions, and dust created by cotton waste.

### **Soil pollution**

In addition to air pollution, the garment and textile industry has no concrete plan for dealing with the solid waste created by effluent treatment plants. The industry currently dumps the waste in yards and in some cases in open spaces around the villages. Farmers and villagers are constantly arguing about this with the dyeing industry. People blame the industry for dumping chemical waste that they say damages ground water during the rainy season. In total about 60 tons of this solid waste (sludge) is generated in Tirupur each day, an enormous quantity considering the lack of space in the region. Most open spaces in remote parts of this region are filled with such solid waste, making the land unfit for any purpose. There have been some studies to look into a solution for this problem, and how to make use of the sludge.<sup>11</sup> There are some indications that it could be used as building material. Recently, the Tamil Nadu Pollution Control Board granted permission to a private company to set up a waste management project with a capacity of 100 tons per day. The private company has agreed to buy the waste for 3 Rupees per 1000 kilogram.

### **Deforestation**

All these issues sum up the environmental pollution situation linked to garment and textile production in this region. But another environmental concern connected to these industries is energy consumption, which includes the (unsustainable) use of forest

products. On average, the dyeing and bleaching industry consumes 1,600,000 kilogram of firewood per day (2,000 kg per company) for factory boilers. This contributes significantly to deforestation in Tamil Nadu. Burning this wood also causes the emission of carbon dioxide. This ultimately contributes to the depletion of the ozone layer. Presently,

Tamil Nadu's forest has decreased from 23 to 17 percent of total land area in just two decades. The continued destruction of forests and the reduction of forest reserves lead to the depletion of water resources and soil erosion. Watershed management has become a difficult task, due to the lack of forest covers in the slopes of the hills. The gradual water flow is now converted as flash floods in the monsoon season.

#### **IV. Analysis of the research findings**

This chapter presents an analysis of the research findings. The following report presents the highlights of the information gathered during literature study, interviews with garment workers, dyeing and bleaching company workers; farmers; owners of several garment, dyeing, and bleaching companies; trade union leaders from the region; and from the analysis of water samples.

More in-depth information on what was learned during the information-gathering phase of this project can be found in appendices 5-10.

#### **Wages and working hours**

In the garment sector there is wide gender discrimination in terms of wages in this region. Women workers don't have equal access to skilled work with good wages. Works with good pay is predominantly assigned for male workers. This exists even in the unskilled category of workers. More than one third of the male skilled workers earn less than the official minimum wage (about 4000 Rupees a month = 84.5 Euro); all female skilled workers earn less than the official minimum wage.

The majority of skilled male and female workers work more than the legal maximum of 60 hours per week (up to 72 hours and more). The majority of unskilled workers work up to 60 hours a week. In the textile and bleaching sector the situation is even worse. Ninety percent of the predominantly male workers earn less than 1500 Rupees (31.7 Euro) a month. They all work more than 72 hours a week.

#### **Workplace safety concerns**

Many of the garment, dyeing and bleaching factories covered in this study had no emergency exits, while some companies that did have emergency exit doors had blocked them with instruments or garment boxes. Clearly, if fire were to break out (as in the Chowdury fire in Bangladesh in 2001, and the Shree Jee fire in 2002, where locked exits were also a factor) massive loss of life would be the result. Many workers carry out their work in small congested halls and hallways in this region, which poses safety risks. None

of the workers interviewed said that safety policies were posted at their workplaces, and very few (7 percent of garment workers and workers from only one of the dyeing and bleaching factories) said that their company provided training in fire safety. So, while 92 percent of the garment workers for example, said that there were fire extinguishers in their workplaces, 93 percent said they did not know how to operate them.

Most of the workers at dyeing and bleaching companies did not use gloves while handling chemicals and detergents. Sometimes, they told researchers, gloves were provided but they did not fit their hands.

### **Health problems**

The demanding work schedule as well as irregular working hours in these industries take a toll on their health. Working hours of skilled and unskilled garment workers and dyeing and bleaching company workers in the Tirupur region are more than of the legal maximum of 60 hours per week and on average reach 72 hours per week. These working hours surpass national and international labour standards.<sup>12</sup> These long working hours affect the food consumption and sleeping patterns of workers.

Doctors in this region view this as one of the reasons for growing alcoholism and depression among workers. In addition to fatigue, poor sanitation and water facilities in the region contribute to workers' susceptibility to diseases.

Forty-eight percent of male and 38.5 percent of female garment workers interviewed identified their working conditions as the main reason for their health problems, while 32 percent of workers in dyeing and bleaching companies also identified that their working conditions are the main reason for their health , which researchers believe is due to illiteracy. They don't have enough knowledge to make a causal relationship between their health problems and their working and living conditions. Most of the garment workers are reported to have been suffering from body pain (also specifically in their limbs), frequent cold, fever, and headache. About 20 percent of dyeing and bleaching industry workers reported having skin diseases and problems such as hair loss, in addition to body pain, frequent fever, cold and headache. Workers in dyeing Pond bleaching units reported as suffering from severe headache when dyeing black fabric. They also believed they had more frequent cold and less sense of smell since they began working with chemicals. Workers complained that when dyeing dark fabrics they felt very tired after being in the process hall for just 30 minutes. Young workers interviewed were very concerned about hair loss (from head and body).

Through the workers were quite young, they reported of having health complaints that are more common among much older people. This suggests that there is a serious impact on workers' health. Though 96 percent of the workers are below the age of 30 they have health problems that usually occur in people over age 50. Forty-four percent of the interviewed workers are between 21 and 25 years, and 28 percent are below 20 years. Many in this category are 14 to 15-year-old child workers.

Along with the health impact of handling hazardous chemicals, workers are also concerned about the health conditions outside the factory, i.e. the impact of polluted water, air and soil. Many workers reside in slums near the highly polluted industrial area.

### **Access to health care**

Low wages place severe financial constraints on garment, bleaching, and dyeing company workers which has an impact on their level of access to health care. All categories of workers interviewed reported that they needed higher wages to cover their basic expenses. Approximately 62 percent of skilled garment workers earn less than 4000 Rupees (84 Euro) per month and on average have five dependents. Workers interviewed reported that they spend 1000 Rupees (21 Euro) per month for rent and that their monthly food expenses (3 meals per day) reach an estimated 2500 Rupees (53 Euro). Because of the scarcity of public supply of water, they need extra money to buy water. Other basic expenses include money for clothing, children's education, and transport to and from work. Meanwhile, workers are trying to contend with major increase in cost -for public transportation (bus service upto 50%), rice (upto 100%), and power (upto 40%). Women workers, who have less access to skilled work and therefore earn lower wages (unskilled women workers earned approximately 1001 to 2000 Rupees (21 to 42 Euro) per month), are particularly hard hit by this increase. So how do these workers afford to pay their health bills?

Workers reported that they are not covered by any health insurance plans or medical claim packages. Workers must pay most of their medical bills from their wages, though they reported that their employer will pay medical costs in the event that injuries are sustained as a result of an accident in the workplace. While government hospitals do exist <sup>13</sup>, more than 60 percent of the workers interviewed

Reported that they would rather consult with more expensive private doctors, demonstrating a lack of faith in the quality of care the public facilities provide. Access to medical care in the workplace is also severely limited as per this researchers. Most of the garment companies and all the dyeing and bleaching companies connected to those interviewed for this study do not have a permanent doctor working on-site. Doctors and nurses never visit these companies. Other than injuries sustained from accidents, companies do not take responsibility for any other health problems that workers might suffer due to their poor working conditions. Most of the companies studied did not even have first aid kits to help workers in case of emergency.

### **Impact of dyeing and bleaching industries on water quality**

Water tested at a variety of locations throughout the region revealed levels of contamination that are cause for serious concern.

The high salt content of the water makes it unfit for drinking, and other uses. The levels of total dissolved solids (TDS) were very high, including those of water samples collected from common effluent treatment plants after treatment (23 times morethan the

permissible level according to WHO standards).<sup>14</sup> Also the water from wells in villages was highly contaminated (15 to 24 times the morethan permissible level). TDS mainly refers to chloride, calcium, magnesium, sodium and potassium content -high levels of which make water unsafe to drink. Alkalinity of the water samples was high, as was the total hardness level of the water. Only one water sample was within the permissible limit of hardness, but had high levels of other chemicals that made it unfit for any use. Levels of other elements, such as calcium and magnesium were also found to be dangerously high in the water that was sampled. The presence of all these chemicals in the water supply can be connected to a wide variety of serious medical conditions, ranging from kidney failure to reproductive and developmental disorders. That the effluent treatment plants are failing to adequately treat the wastewater is apparent -not just from the analysis of samples of water coming out of the plants, but simply to the naked eye. Sixty-four percent of the farmers interviewed reported that the water leaving the plants was black, 20 percent reported blue water flowing out of the plant, while 8 percent reported red water and another 4 percent reported seeing yellow water coming out of the plants.

### **Other environmental concerns**

Workers interviewed identified not only well water contamination by dyeing and bleaching industries as an environmental concern linked to these industries, but also the mixing of untreated effluents in the river, dumping of solid waste, and collection of excessive water for dyeing and bleaching industries. They also mentioned the emission of gases from dyeing and bleaching plants, the placement of garment, dyeing, and bleaching units in residential areas as environmental problems for the region. One of the key findings of the water sample analysis -common and private effluent treatment plants are not effective and release water that after treatment is almost the same as untreated waste water -is widely reflected in the opinion of the farmers, workers and trade union activists. Comparatively, and not surprisingly, farmers interviewed complained more strongly than workers about the presence of the garment industry in the region.

### **Impact on availability of water**

This research confirmed that water scarcity is a serious issue for those living and working in the Tirupur region. Availability of water has had an impact on livelihood and spending patterns of those in this region.

Quantity and quality of drinking water is a major problem for those working in these industries. Only 36 percent of workers in garment companies receive quality drinking water. Sixty-four percent of workers in dyeing and bleaching factories receive water in substantial quantity but the water is not of the same quality as the water garment workers receive. The majority of the garment workers (83%) and dyeing and bleaching industry workers (68%) interviewed received less than 20 litres of drinking water per week, which is only a fraction of the water necessary to meet their weekly needs. Availability of quality water is also a serious concern for other middle and low-income people throughout the region.

### **Impact of dyeing and bleaching industries on farmers**

All of the farmers interviewed during this research project reported that water and other forms of environmental pollution were a result of the local dyeing and bleaching industries. Nearly 90% said that untreated waste released by these industries into rivers and canals is a major environmental problem. They also did not hide their displeasure at the excessive water consumption of the dyeing and bleaching industries.

The information collected from the interviews with farmers reflects the general decline of cotton cultivation in the region. Ten years ago 64 percent of the farmers cultivated cotton; currently only 4% of the farmers. The fall in cultivation of cotton and other crops like, rice and vegetables are due to the loss of ground water and river water irrigation. Ten years ago 92 percent of the farmers used groundwater for irrigation and 4 percent used river water irrigation. Today only 32 percent of the farmers use groundwater irrigation; river water irrigation is not used any longer. This change in irrigation pattern is attributed to water pollution and the excessive water consumption of the dyeing and bleaching industry.

The farmers also complained about health problems caused by the garment industry. The farmers believed that they suffered from skin problems (36%), breathing problems (12%) and dysentery (4%) as a result of the (pollution caused by the) dyeing and bleaching industries.

More and more, farmers in the region are shifting to other professions. Some farmers are selling water to dyeing and bleaching companies to earn money to support themselves. Some even use free power provided by the state to pump water for such enterprises. This research revealed that farmers are an ageing population; just 4 percent of farmers interviewed were less than 30 years old, while 56 percent were over 51 years. Agriculture is no longer attractive to young people in this region, which in addition to the contamination of water, contributes to Tirupur's agricultural crisis.

This research found that farmers' income is insufficient to meet their needs. Though farmers do have less income than garment workers do, it should be noted that they do have food security. This research demonstrated that the expenditure patterns of some farmers are not in tune with their income -they spend more than they earn. Eighty-four percent of the farmers interviewed had five or more dependents. All reported that they receive polluted water, and many noted the pressure they feel due to the lack of government subsidies and price supports for crops and the growing expenditure necessary for buying pesticides and fertilizers.

### **V. Recommendations**

This study reveals industry practices in Tirupur which are unsafe and unhealthy for its workers and also are posing a threat to the environment. Based on the findings from the interviews with workers, farmers, trade union leaders, factory owners and concerned government officials, along with our own perspective in the issues, several recommendations have been compiled for addressing these problems. In general, the aim of the measures included below are to transform the existing manufacturing process into a safer, cleaner, and more sustainable process.

- ❖ To address the problems of water pollution and scarcity of ground water recharging programs should be initiated by industry to clean the ground water and raise the ground water level.<sup>15</sup> Such projects should be massive in nature and at least should cover a twenty kilometre stretch of the Noyyal river basin. The projects should involve local workers and residents to make it a people participatory action plan.
- ❖ The dyeing and bleaching industries should also launch programs such as rainwater harvesting projects to reduce water scarcity.
- ❖ More effective treatment plants should be installed. All the 800 dyeing and bleaching plants should install effluent treatment plants either individually or commonly. No wastewater should be discharged either into water resources such as rivers and ponds or into open vacant lands.
- ❖ To address findings that they are not functioning properly (i.e. treated water is still seriously polluted), the operation of existing privately owned and common effluent treatment plants should be thoroughly evaluated<sup>16</sup>. Existing treatment plants should be upgraded with an aim of reducing the level of total dissolved solids and toxic chemicals. Treatment to reduce hardness of the water must be conducted.
- ❖ Solid waste generated by the effluent treatment process should be disposed off in closed yards with concrete floors. No solid waste should be dumped in open yards and vacant lands in villages, as this contaminates ground water, damages adjacent farmland, and has other negative environmental impacts. More research should be carried out to investigate the possibilities of recycling this solid waste (for example, the possibilities of using such waste as building materials or binding material for laying roads should be explored).
- ❖ Dyeing and bleaching plants are located in the area around the Noyyal River Basin, and in the area of the Bhavani and Cauvery Rivers, which provide water to millions of people. The potential for large-scale environmental damage exists, therefore environmental groups should set up an organization to independently monitor the activities of dyeing and bleaching plants.
- ❖ Given the vast amount of firewood consumed by the industry, large-scale tree plantation programs should be launched by the industry with the support of local organizations and residents.
- ❖ Energy audits should be conducted at dyeing and bleaching plants. Environmental organizations should be involved in these audits. Instead of burning fossil fuels or wood which emit high levels of carbon dioxide, the use of wind and solar energy should be investigated as alternatives.
- ❖ Workers in dyeing and bleaching plants must be provided with gloves to use while handling toxic chemicals. Protection masks must be provided to all the workers inside the factory and their use should be mandatory. There should be health and safety training provided for the workers, given the very low level of awareness and concern that the dyeing and bleaching workers demonstrated, due to illiteracy and youthfulness.

- ❖ Workplace safety for all garment industry workers, including those at dyeing and bleaching units, must be improved. Safety measures to be taken should include the installation and regular inspection of fire extinguishers, regular fire drills (every six months), and accessible emergency exit doors. Workers in each section must be trained in fire safety measures. Gloves and masks must be provided to all the workers. Other measures that have an impact on health -such as the placement of exhaust fans, good lighting, and sufficient space between workers must be provided in the workplace. Local trade unions and labour rights NGO's should initiate workplace safety campaigns. These campaigns should seek support from international organizations already involved in promoting occupational health and safety training. Pressure should be put on multinational companies involved in these industries to support such measures.
- ❖ Free medical check ups with a permanent on-site doctor should be provided to workers in the workplace. First aid kits should be made available in all workplaces. Employers should provide compensation for all medical bills, not just accident-related medical costs. All the workers must be immediately enrolled in the Employees State Insurance scheme irrespective of period of service. Again, international campaigns should put pressure on multinational garment corporations to support these demands.
- ❖ Pressure should be put on multinational garment companies to play a role in the clean up of the environment in Tirupur. International campaigns will also have a role in engaging consumers to take up these issues. Addressing the environmental damage caused by garment production should also involve rehabilitation works for the farmers affected by these practices.<sup>17</sup>
- ❖ Explore legal possibilities for compelling garment companies to change their practices or provide compensation for damages. For example, individual activists or NGOs can explore the potential of bringing cases before the District Court of Coimbatore or the High Court of Chennai. Even if such initiatives require money and involve a slow legal process, they should not be ignored. Access to experienced and committed lawyers, not susceptible to industry pressure will be crucial if such cases are pursued.
- ❖ Corporate accountability legislation -at the European level and laws being developed by individual nations, such as the Netherlands, that are home to the companies involved in the multinational garment industry -should also take up environmental concerns.
- ❖ International support (in the form of loans or subsidies) should be earmarked for the development of solar and wind energy in garment producing region, to help phase out the garment industry's use of environmentally unsustainable processes such as the burning fossil fuels or wood. Financial incentives should be provided for companies switching to sustainable energy methods (such as solar and wind energy).
- ❖ The Tamil Nadu Pollution Control Board should take a more active role in preventing industries from polluting Tirupur's water.

- ❖ Encourage local industry representatives to approach these issues with an open mind and a long-term perspective. Many of the factory owners and their associations were found to be aware of the kind of environmental impact created by their industry. They must co-operate with all concerned stakeholders in the region and the international market to implement higher environmental standards for their production processes.

## **VI. Conclusions**

This project aimed to gather information on health and safety concerns for those working in the garment, dyeing, and bleaching industries, and also the impact of those industries on the environment.

Researchers found serious problems through interviews with a broad sample of stakeholders. This study revealed working conditions at garment, dyeing, and bleaching facilities that included cases of gross violations of workers rights and environmental norms as enshrined in the core the conventions of the International Labour Organization (ILO) and the United Nations (UN) and national laws. Perhaps the most important thing revealed by this research is that water pollution and the lack of infrastructure affects all workers and the general population. The water crisis in Tirupur will clearly be a complex and difficult issue to resolve -the research findings are evidence of this.

Levels of income and expenditure for workers, as documented through interviews, showed that those who earn little are spending a great deal on medical expenses and for the purchase of water. Meanwhile, their employers are doing little to address these issues -not the environmental impact of their business practices which has polluted the local water supply or establishing systems to provide quality health care to employees. Working conditions that do not meet national or international health and safety standards heightens risks to employees.

Better effluent treatment processing methods must be adopted by Tirupur's dyeing and bleaching units. The common effluent treatment plants must aim to bring down the level of totally dissolvable salts in treated water, so that it is safe for environment heightens. Zero discharge and dye bath segregation <sup>18</sup> of treated water should be implemented in the process units to control the pollution of ground water and the Noyyal River. Better treatment methods will also bring down the level of sludge generated by these plants.

There is a need to preserve the cotton farming in entire Coimbatore District. Making a transition to organic agriculture could be an option that should be more thoroughly investigated.<sup>19</sup> Taking action to protect this region's water resources should be a priority but also taking steps to create water resources, for example, via rainwater harvesting Recharging ground water should receive attention.

While this study reveals serious problems connected to the export-oriented garment industry, the intention is not that these findings fuel drives to push the industry out of this region. The loss of additional jobs would be an added disaster for the region. This study was conducted by organizations that are committed to pushing for responsible corporate behaviour, and encourage industries to live up to their responsibilities in terms of providing safe, healthy and good working conditions that are environmentally sustainable. International corporations that set the standards in the global garment industry should not cut their losses and move onto other communities where people might not be aware of the damaging nature of their practices; instead they should work together with local communities to find viable solutions. The garment industry, and all processes associated with this industry, including dyeing and bleaching, must be restructured with an open mind towards environment impact. While this study documents conditions in Tirupur, additional research will be needed in the future to investigate sustainable alternatives.

During this research project the view that something must be done to improve working and general living conditions was found to be widespread among garment workers, dyeing and bleaching factory workers, farmers, trade union leaders, and even factory owners. Farmers, doubly effected by the industry's pollution of the water, both in terms of personal consumption and loss of livelihood, raised the issue of water quality and availability most vociferously.

There is an urgency that the issues highlighted in this report are taken up by a broad-spectrum of activists, beyond the Tirupur region. Local farmers fail to come together to take a stand against the damaging practices of the garment and allied industries. Industry associations are seen as adversaries that are too financially powerful to take on. State government affords the export-oriented garment industry an almost sacred status, and therefore fails to investigate the environmental costs of the industry. Indeed, only co-ordinated international action involving stakeholders in this region will ensure that appropriate changes are made to ensure the protection of the environment.

### **Appendix**

1. The main focus of earlier studies, like the SOMO report 'The reality behind the code', focus mainly on working conditions in garment factories. This study mainly focus on preceding production stages, i.e. textile dyeing and bleaching processes. This was regarded as a good opportunity to gather information about labour conditions in the dyeing and bleaching industries.
2. Laws and notifications relating to environmental protection, health and safety in India and Tamilnadu can be found in full report.
3. The selected villages are situated at 5 to 10 kilometre distance from the river banks.

4. 'Knitwear exports Likely to surge', Indian Express, 10-12-2000
5. According to exchange rate 1 Indian Rupee = 0.0211283 Euro
6. Joris Oldenziel, The reality behind the code, Amsterdam: SOMO (2001)
7. Employers pay the medical bill only, in case of serious accidents. Workers have to pay other medical bill themselves.
8. 'Black soil' is a term introduced under British colonization. It's a translation of the Russian word 'podzol', a geophysical term to describe high fertile soil.
9. Today India imports cotton from the United States of America. In 1999 to 2000, 2.2 million bales of cotton were imported from the USA. In 2001, up to August, 1.6 million bales of cotton were imported from the USA. Percent of the total cotton export from the USA is for India. It is expected to increase 40 percent at the end of 2001.
10. Behind China and the United States, India is the world's third major cotton producing country. Lack of government support has created a chain of poverty among cotton farmers. Two years ago many cotton farmers committed suicide owing the failure of cotton crop which sent shock waves all over the world.
11. The environmental division of the Public Works Department of Tamil Nadu has conducted a study on alternate use of sludge in 2000.
12. The national standard for working hours is 8 hours per day and 2 hours overtime work per day, 6 days a week (a maximum of 60 hours a week). According to 10 standards (International labour Organization) national laws regarding working hours and overtime work should be respected.
13. Government hospitals don't charge any fees except a small amount as a registration fee.
14. World Health Organization (WHO)
15. According to experts - we consulted Dr. R.K. Sivanappan of the United Nations' Food and Agriculture Organization (FAO) -ground water can be cleaned step by step. The existing pollution should be stopped by creating wells linking the ground water with flood and rain water over a period of ten years. The water can be used for household and industrial purpose but will not

- yet be fit for drinking. Over the years, if the cleaning process is continued, the water can be used as drinking water again.
16. Privately owned effluent treatment plants are individual plants inside the factory premises. Common effluent treatment plants are collectively owned by a group of companies. The factories are linked with the plants through a pipeline system.
  17. Rehabilitation works should consist of supporting farmers in constructing rain water harvesting systems. Development works should ensure cooperative initiatives for more cotton farming to restore the region's original farming activities.
  18. The term 'zero discharge' is a standard for water treatment, meaning that treated water should not contain any amount of effluent. Dye bath segregation is a recycling method based on closed water supply systems. After segregating dyes and water, the water can be used repeatedly.
  19. Organic cotton farming won't pollute land and water with chemical pesticides or fertilizers. Furthermore traditional cotton seeds consume less water than upgraded species such as hybrid or genetically modified seeds.

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