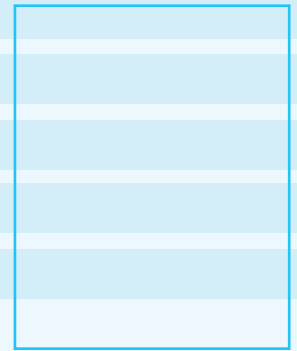


SAWA PGD Fellow	:	Kalpana S
Institution	:	CWR, Anna university
Designation	:	
Title	:	Water Contamination due to Tanneries and its Health Impacts
Email	:	



Background:

Water is a natural, but scarce resource, now it is a critically stressed resource especially in urban areas. Water is common to all and is an open access resource. Increasing population increases the demand on water, but generally the supply does not satisfy the demand. People started to use water from other water bodies like lakes, ponds. Now, with the lakes and ponds getting lesser quality of water, people have started using groundwater more as a resource for their drinking/domestic purpose. Leather production is a major industry in India, which makes a significant contribution to the country's foreign exchange earning and provides employment opportunities to about thirty lakh people. The industrial tanning plants transform skin into leather by means of a series of chemical and mechanical operations.

The respiratory tract is the major target organ for chromium (VI) following inhalation exposure in humans. Shortness of breath, coughing and wheezing are from a case of acute exposure to chromium(VI), while perforations and ulcerations of the septum, bronchitis, decreased pulmonary function, pneumonia and other respiratory effects have been noted from the chronic exposure. Other effects noted from acute inhalation exposure to very high concentrations of chromium (VI) include gastrointestinal and neurological effects, while dermal exposure causes skin burns in humans. Inhalation of chromium (VI) by a human carcinogen, resulting in an increased risk of lung cancer (USEPA, 2004). Leather tanning sector is included in the Red category of industries due to the potential adverse environmental impact caused by tannery wastes on environment. The major components of the tannery effluents are the toxic trace metals. The percolation and movement to groundwater by chromium is one of the major sources of contamination of groundwater. The health impacts on people who use such contaminated groundwater may range from sub lethal to chronic impacts. The study of contamination and its health impacts on people is an important aspect of this study to be conducted in Pammal area in South Chennai.

Objectives:

1. To study the impacts of tannery effluents on the groundwater quality in Pammal area.
2. To study the health impacts, if any, on various categories of the local population in the Pammal area.

Study area:

Pallavaram and Pammal are having more number of tanneries in their locality. The Tambaram taluk falls in the Kanchipuram district area. It is lying below the Adayar River. The total area of Pammal municipality is 13.8 km². It is lying in the latitude of 12°58' 29.9994" to 12°58' 48" and longitude 80°8' 4.9986" to 80°10' 48" degrees. This is the study area of the present investigation. Industrial activity, mainly tanneries have flourished in this area, some of the tanneries are century old and many of the tanneries are 30 years old. The tanning industries of the area can be divided into two categories according to their processes.

Methodology:

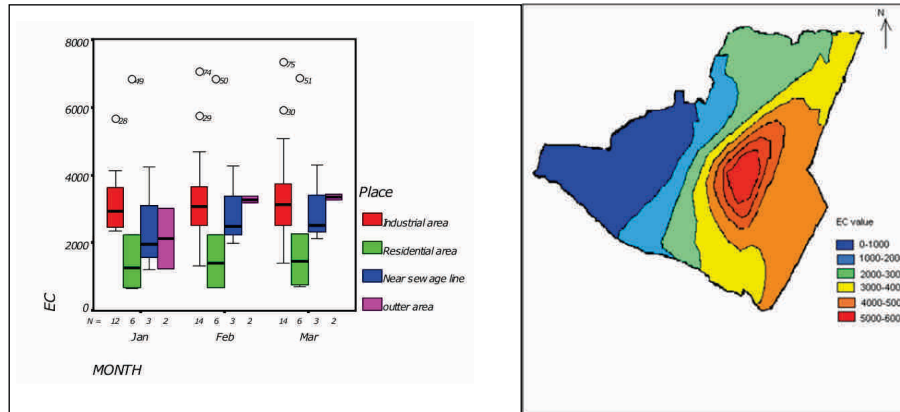
Secondary data are collected from their sources for the Pammal Municipal area. The groundwater samples were collected from the study area. The area is divided into four types. They are industrial area, residential area, near the outlet point, adjacent area. The water samples were taken from 23 dug, bore wells in the area for the January month. Water samples taken for the February and March month has increased to 25. The chemical parameters analyzed in the laboratory are pH, Electrical Conductivity, Total Dissolved Solids, Chloride, Sodium, Bicarbonates, Sulphates, Potassium, Calcium and magnesium. Water quality analysis has been done as per standard procedures given by APHA.

A semi-structured questionnaire for people has prepared and conducted with the people. A study on people living in the Pammal Municipality area was conducted through a questionnaire survey on the water quality perception, type and source of water use in the

household and the general health health problems. The questionnaire survey was focused on a 1% sample of the total number of households (11,228) present in that municipality. A questionnaire was designed to collect information from the households covering such aspects like the household economy, education and age group, groundwater quality, drinking water source etc.

Research Findings:

The similarity in the spatial pattern of variation in EC, Na, Cl in the study area may suggest a close correlation between these variables. It also suggest that since sodium chloride is one of the main constituent used in the tanning process and it is being the dominant salt in the effluents discharged by the factories in the study area, the possibility of its leaching into the groundwater below the industrial area is enhanced.



Decreases in concentration in the chromium values are obvious over the period of two years in the study area in all the locations. The concentrations reported in this study are found to be within the limits permissible for drinking sources, whereas during 2007, the reported values exceeded the limits by an order of magnitude. Though the concentrations are much lower in the present study, the pattern of variations indicates a close similarity with EC, Chlorides and Sodium.

The questionnaire survey was conducted through personal interviews for total of 90 selected households. The households are selected for the survey based on the following criteria: Households near the industries, Households are in the non-industrial area, Households in that people using groundwater for drinking purpose, Households near the sewage line, Households are in adjacent to the study area. The responses to the questionnaire were tabulated and analysed using SPSS.

The major diseases identified in the survey in the order of prevalence in the study area are ulcer, breathing problem, skin problems, frequent dizziness, Itching and rashes, fever. The incidence of these issues is significantly higher in industrial area than residential or adjacent areas. Further, the incidence of above diseases are more prevalent in people having lesser income (51%), living near the industries(50%) and people using for groundwater for drinking (11%) and for domestic purposes (64%).

