DISEASE ANALYSIS OF TANNERY WATER AFFECTED AREAS OF DISTRICT KASUR OF PAKISTAN BACKGROUND OF THE STUDY

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ABSTRACT

Kasur is well-known for its enormous leather industry, however the city pays a high price in terms of water pollution as a result of this business. Water within a broad radius of this leather manufacturing sector has been designated unfit to drink. As a result, this contaminated water has a negative impact on human health. This research is a small attempt to investigate the problems produced by water contamination. Surveillance was carried out in Kasur for this aim, and the results were assessed. Both males and females had a high prevalence of morbidity from various diseases, according to the findings.
Key Words: *Water pollution, Tannery, Human Health, Skin diseases*

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BACKGROUND OF THE STUDY

Water is the most essential component of humans needs generally. Unhygienic water is a big source of infections in humans through inorganic chemicals, poisons, pathogens and carcinogenic items. They all contaminants cause chronic and acute diseases globally (Xagoraraki, 2008). One of the major environmental problems is water pollution, which is directly affecting human health and environment. Pollution is directly affected by chemical, biological and physical stressors. Water pollutants include radio activity contamination and heat while radio activity should be considered as chemical pollutant. All living beings can be possibly related to biological contamination, although aggressive classes and pathogens are the ones getting the attention (Tarazona, 2014).

The study by Tornqvista (2011) explained that underground water is affected by industrial and agricultural contaminants. They may cause decrease in yield, increased health diseases due to high ratios of chemical contamination of nitrite, arsenic, copper and DDT etc. One of the major terrors in Pakistan is water pollution for public health. Here water is of poor quality which is not checked and managed. Out of 122 countries Pakistan is on 80th number for drinking water quality. All sources of water underground or on surface are impure and polluted with toxic metals, coliforms and other insecticides. WHO regulations are extremely violated. Unsuitable removal of industrial and public waste and agricultural chemicals are major source of water quality deterioration (Azizullah, 2011).

Few urban areas have increased level of arsenic in surface and underground water as well. Water is contaminated with arsenic through anthropogenic effect and industrial waste. Geochemical proofs suggest that contaminant organics from unconstrained sewage and additional foundations pushes decrease of hydrous ferric oxide (HFO) discharging arsenic to surface and underground water (Nicksona, 2005). Bad water quality is directly associated with water borne diseases, increased cost of living and cost of sickness, high morbidity and early mortality and finally preventive measures (El-fadel, 2011).

Water pollution has a big influence on cost of living monetarily. Author focused that only passing laws in legislation and creating institutional arrangements are not necessary but also required to address problems of environment. Policies must be implemented in their true spirit. Institutes must be given autonomy and supremacy to deal all kind of environmental issues (Reddya, 2006).

Arsenic is described as most consuming toxic chemical in water in any country. About 27 million people use water having more than 50 μg l−1 Arsenic and more than 50 million drink water having Arsenic above 10 μg l−1 . Long intake of arsenic water can create skin diseases, vascular ailments, neuropathic issues, cancer, lungs and heart issues, and diabetes etc (Ravenscroft, 2011). Studies of (Bibia, 2015) revealed that level of Arsenic is differently concentrated in different areas; their results are significant (p <

0.05) having positive correlation. Irrigation water plays a major role in growing microbial pollution and reducing inorganic ingredients in groundwater (Rajasooriyara, 2013). Lands geographically attached with tannery areas in Kasur, Pakistan are infertile because of seepage of polluted water of leather factories. Experiments are done on plants including Salvadora oleoides, Suaeda fruticosa, and Calatropis procera. The study concluded that increased rate of chromium and other metals in water created less biomass in plants with it showing toxicity. So ultimately these metals are creating disturbance in human lives as well (Firdaus e Bareen, 2011). The present study investigates the problems produced by water contamination of the leather industry in Kasur. The household level data has been collected from Kasur district for this purpose by using multi-stage sampling methodology.

MATERIAL AND METHODS

The study was conducted in Kasur district of Punjab province of Pakistan. The study used multi-stage sampling methodology for data collection. Five union councils were selected randomly, comprising urban city Kasur No. 4 & 6, Sheikh Ammad, Hussain Khan wala, and Bahadur pura. These union councils are selected because they are geographically attached with tanneries of Kasur. The waste water of these lather factories pass through these union councils in a drain (Rohi Nala) and passing through effluent treatment plant and ultimately falls into the river Satluj. For this purpose surveillance was conducted with the collaboration of District Coordination Officer Kasur and cooperation of health dept. Kasur. Household survey was conducted. Family head and house wives were respondents. Overall, the study collected the data from 131896 individuals from Kasur District. Prevalence rate of all diseases included in our study was calculated and their comparison was done to analyze the effect of tannery water on human health. Data was collected on a form from each house situated in the radius of 1-Km from drain of waste water. Reason to choose this area was the seepage of polluted water in this area. MS-Excel was used for calculation and analysis. During study the following diseases were interrogated; Skin diseases, Bone diseases, Gastro diseases, Liver and Cancer cases, and other cases (heart, diabetes etc.).

FINDINGS OF THE STUDY
The study interviewed 45% male and 55% females from Kasur. Table 1 shows Union council wise distribution of male and female. The study found that 1599 people are affected by the diseases. Their proportions are shown in graph 2 and 3.

Table 1: Total population, Gender and UC wise

Sr. No.	Name Of Union Council	Male	Female	Total
1	*Hussain khan wala*	*10312*	*13123*	*23435*
2	*Bahadur pura*	*12573*	*15485*	*28058*
3	*UC 6 Kasur*	*13270*	*15274*	*28544*
4	*Sheikh Ammad*	*11342*	*13759*	*25101*
5	*UC 4 kasur*	*12238*	*14520*	*26758*
Total		***59735***	***72161***	***131896***

Graph 1: Percentage of Sick Person by Gender
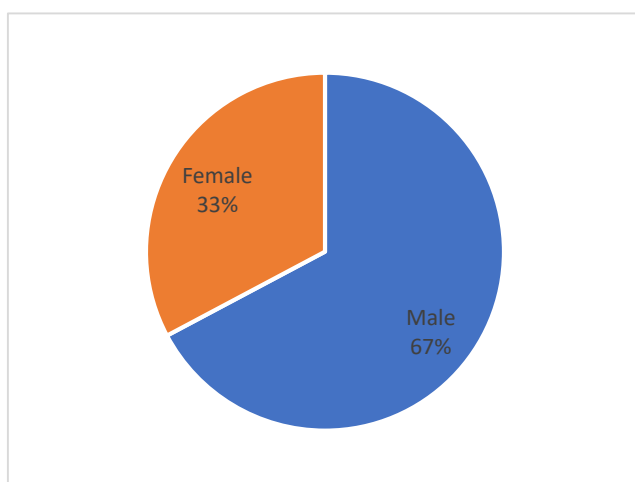
Graph 2: Proportionate Morbidity Rate by Gender
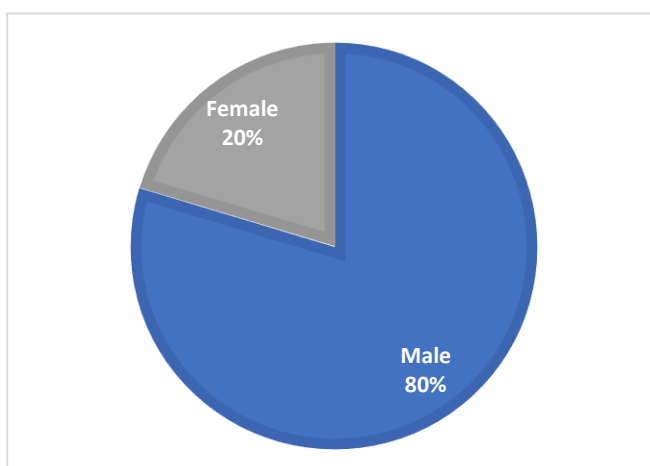
Out of 131896 people, 624 persons were having skin diseases out of which 398 were male and 226 were female. 63.78% were males and 36.22% were females those who caught by different skin ailments. Out of total 247 persons were having bone diseases. Out of which 67% were male and 33% were female. 194 people in this study were recorded suffering from Gastro and abdominal diseases out of which 67% were male and 33% were female. Proportionate for Liver diseases was: 61% male and 39% female, while total cases of liver diseases were 235. Cancer cases were 33 in number having 70% males and 30% females. Other minor ailments counted 266, out of which 80% were male and 20% were females.

Table 2: Prevalence of Diseases by Gender and UCs

| S. No | Name Of Union Council | Skin Disease | | | |
		Male	%	Female	%
1	Hussain Khan wala	145	93.548	10	6.451
2	Bahadur pura	12	75	4	25
3	Uc 6 Kasur	36	50	36	50
4	Sheikh Ammad	150	55.555	120	44.444
5	Uc 4 Kasur	55	49.549	56	50.450
	Total	*398*	*63.782*	*226*	*36.217*
		Bone Disease			
1	Hussain khan wala	66	88	9	12
2	Bahadur pura	8	53.333	7	46.666
3	UC 6 Kasur	16	57.142	12	42.857
4	Sheikh Ammad	42	62.686	25	37.313
5	UC 4 kasur	38	61.290	24	38.709
	Total	*170*	*68.825*	*77*	*31.174*
		Gastro Disease			
1	Hussain khan wala	72	87.804	10	12.195
2	Bahadur pura	8	57.142	6	42.857
3	UC 6 Kasur	39	45.882	46	54.117
4	Sheikh Ammad	2	100	0	0
5	UC 4 kasur	9	81.818	2	18.181
	Total	*130*	*67.010*	*64*	*32.989*
		Liver Disease			
1	Hussain Khan wala	39	97.5	1	2.5

2	Bahadur pura	19	76	6	24
3	UC 6 Kasur	21	36.206	37	63.793
4	Sheikh Ammad	51	61.445	32	38.554
5	UC 4 Kasur	13	44.827	16	55.172
	Total	*143*	*60.851*	*92*	*39.148*
	Cancer Disease				
1	Hussain Khan wala	1	100	0	0
2	Bahadur pura	7	70	3	30
3	UC 6 Kasur	10	66.666	5	33.333
4	Sheikh Ammad	2	100	0	0
5	UC 4 Kasur	3	60	2	40
	Total	*23*	*69.696*	*10*	*30.303*
	Other Disease				
1	Hussain Khan wala	102	94.444	6	5.555
2	Bahadur pura	20	86.956	3	13.043
3	UC 6 Kasur	15	68.181	7	31.818
4	Sheikh Ammad	66	66.666	33	33.333
5	UC 4 Kasur	8	57.142	6	42.857
	Total	*211*	*79.323*	*55*	*20.676*

Overall morbidity rate of all diseases in tannery affected areas is high, which is an alarming situation for health department and general public. Furthermore the results are crucial which are also up to some extent reported by health department. Pure and clean water has a very strong relationship with disease morbidity rate. All the diseases can be handled easily. Previous studies indicated that clean water can reduce the risk of skin, bone, gastro, cancer, and liver diseases.

CONCLUSION AND POLICY OPTIONS

Based on the findings of the study there is a dire need that every tannery must have its indoor effluent plant to remove chromium from water waste. Furthermore, the main treatment plant is not working due to poor lime titration, it must be improved. Waste water drain must have "Brick Soiling" in its bed to avoid absorption of water deep into earth, so that subsoil water may not be polluted. Provision of safe drinking water supply by public health schemes in its catchment area. Health education should be promoted in

public regarding prevention of diseases. Mobile medical squad should be activated for detection, treatment and referral of patients in affected areas.

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