

Impact of Leather Industry on Human Health in Uttar Pradesh

Article

By

Dr. Kamrul Hasan

Post Doctoral Fellow, ICSSR, New Delhi,

Affiliation, Giri Institute of Development Studies Sector-O Aliganj Lucknow, U.P.

Subject: Economics

Abstract

This paper analyzes Impact of Leather Industry on Human Health in Uttar Pradesh first up all to understand the leather industry and what are the problems create on the human health. Firstly define the objective of this paper than given the and methodology of article. In this paper used primary secondary data from different sources. This paper analysis to health related issues the like Eye infection, Bronchitis, Stomach related problem, Skin diseases/cancer, Children related diseases and others problems. This paper also tells us a comparative analysis of leather industry and health problems, the purpose of this analysis actual situation of highlight for the future policy planning.

Key words: Effect, Human Health, Hazardous, Leather, Industry.

1. Introduction

Tanning is the process of converting raw animal hide into leather. During this process two type techniques using by leather industry, first vegetable and second is chromium tanning. Though vegetable tanning is large process method than chromium tanning. Vegetable tanning using the primary barks used chestnut, oak, tanoak, hemlock, quebracho, mangrove, wattle and myrobalan etc. Hides are stretched and clean on frames and immersed for several weeks in vats of increasing concentrations of tannin. Plant extracts are used for the purpose of tanning in this process. The pH falls down from 4- 4.5 to 3-3.5. Though this process is free of any heavy metal use, the leather developed from this process has comparatively weaker capacity of heat resistance and dye- holding. Chrome tanning is faster than vegetable tanning and produces stretchable leather which is excellent for use in handbags and garments. Depending on the finish desired, the hide may be waxed, rolled, lubricated, injected with oil, split, shaved and, of course, dyed suedes, nubucks, etc. are finished by raising the nap of the leather by rolling with a rough surface. Basic chromium sulphate ($\text{Cr}_2(\text{SO}_4)_3$) (7-10 %) containing 25 percent Cr_2O_3 and sodium sulphate (25- 30 %) is used in chrome tanning. part of the pickle bath is used for chrome tanning operation. The pH is increased to 3.8-4.0 at the end of chrome tanning process which is called basification. The semi- finished either after chrome tanning is called wet blue. Of the total leather production in India, more than 80 percent is based on chrome tanning and the rest is based on vegetable tanning.

Both process using three stages making finish leather first appall collection of hide and skins and using lime for safely storage a large time it is called pre- tanning. Second is tanning process, tanning process using three treatments, chemicals treatment, biological treatment and biological treatment plus chemical treatment, though chemical treatment not fully efficient for tanning so need of biological treatment in this stage. In this process using about 130 types of chemicals depended upon condition of hide and skin. Main chemicals are azodyes, cadmium, compounds, cobalt, copper, antimony, barium, lead, selenium, mercury, zinc, arsenic, polychlorinated biphenyls (PCB), nickel, formaldehyde resins and pesticides. Third stage finish leather process using chemicals for leather are soft, flexible and color mixing need for hide and skins.

In term of the chemicals used and tanning method, a lot of pollution is caused during each operating level. These pollution parameters can be classified as solid, liquid and gas. BOD, COD, Sulfide caused by the hair- removing

process and Cr (III) caused by chrome tanning method, which is used as an alternative method to alternative vegetative methods, seriously affect the treatment process. These chemicals are used to impart certain properties, e. g. appearance, softness, flexibility, color strength, etc. as per the requirement of the finished product. These chemicals also react with the collagen fibers of the tanned leather and again a maximum quantity of the applied chemicals is retained by the skins, whereas un- reacted or residual chemical is discharged with the wastewater of the process.

The tanning industry gives rise to two types of hazard involving chemicals. These are, firstly, those concerning particular chemicals used in the various tanning processes, and secondary, chemical substances produced as by-products by the chemical reactions occurring when a hide undergoes the tanning process. The first type of hazard includes the vast majority of chemicals to be found in tanning. It is possible to divide these materials into groups based either on the particular degree of hazard they present, or on their chemical nature (e. g. acids, alkalis, etc.) In the second hazard type defined above the major by- product which presents a chemical hazard to is hydrogen sulfide. In terms of toxicity and potential to cause a hazard it is a relatively straight forward task to divide a typical list of chemicals used in tanning into three groups representing major, moderate, and minor potential hazards.

Past and present tannery workers described and displayed a range of health conditions including prematurely aged, discolored, itchy, peeling, acid-burned, and rash-covered skin; fingers corroded to stumps; aches, dizziness, and nausea; and disfigured or amputated limbs. Although (Human Rights Watch report, 2012) is not aware of any epidemiological studies on cancer among tannery workers in Bangladesh, some anecdotal evidence suggests that cancer rates are indeed elevated among workers dealing with chemicals.

Many common health problems that tannery workers face—such as skin and respiratory diseases—result from repeated exposure to a hazardous cocktail of chemicals when measuring and mixing them, adding them to hides in drums, or manipulating hides saturated in them. Some chemicals can be injurious to health in the short term, such as sulfuric acid and sodium sulfide that can burn tissue, eye membrane, skin, and the respiratory tract. Others, such as formaldehyde, azo-colorants, and pentachlorophenol, are confirmed or potential human carcinogens, the health effects of which may only manifest years after exposure (Human Rights Watch report, 2012).

Industrial effluents which discharged from the textile and tannery contains a higher amount of metals especially chromium, copper and cadmium. These effluents released on the land as well as dumped in to the surface water which ultimately leaches to ground water and lead to contamination due to accumulation of toxic metallic components and resulted in a series of well documented problems in living beings because they cannot be completely degraded (Malarkodi et. al. 2007). Hence, industrial effluents offer a wide scope of environmental problems and health hazards are becoming more complex and critical not only in developing countries like India but also in developed countries. In 2008, a study by scientists at the Indian Institute of Toxicology Research found that tannery workers had double the risk of morbidity when compared to control groups. The main findings suggested that increased exposure to leather dust, which contains high levels of chromium, was responsible for the significantly higher rates of morbidity. Carcinogenic compounds and a variety of highly toxic chemicals were found in the tanning process. (Sean Gallagher, 2014)

2. Objectives of the study

The study attempts to analyze the impact of leather industry on human health in Uttar Pradesh on more specifically, it also at us following objectives:-

- To analyze the adjoining areas like those of human health settlements.
- To analyze leather industry's labour health problems
- How could the Protection of diseases generated by leather industry

3. Hypothesis

The following hypothesis will be listed in the area of which study:-

- The level of industrial pollution adversely affects human health levels.
- Industrial pollution largely affects the adjoining areas people.

5. Methodology

In this paper methods are use first up all the selection of study area Kanpur area was selected because the place in known to be one of India's most polluted cities, and it is third largest tanning center in India. Even though Kanpur and Unnao are as a case of the tanning industry in India, it must be mentioned that the variation between the different places in India is great and the tanning industry in India is diverse. Primary data was collected use of questionnaires, schedules; two type schedules was prepared tannary labour and household schedule. The qualitative data was also recorded through field dairy use, through inverviews, observation and group discussion. In this paper also use secondary data from different sources, secondary data collected from different reports of international originations and country, government of India, state government of Uttar Pradesh and local bodies in like Nagar Nigam and Nagar Palika Parishad and books, journals, news paper different websites and others source.

6. Analysis and discussion

A chi-square test was performed and no relationship was found between industrial pollution and neighbors households, X^2 (df=8, N=100) = 5.485, $p=0.070$ ($p<0.05$, at 5% level of significance). Therefore we have rejected the experimental hypothesis (H_a) and null hypothesis (H_0) is accepted.

Table 1: Distance and how feel of Respondent

Distance		Better	Bad	No Effect	Total
Up to 100 Meter	Observed	0	15	7	22
	Expected	0.22	15.62	6.16	22
100 Meter to 200 Meter	Observed	0	15	6	21
	Expected	0.21	14.91	5.88	21
200 Meter to 300 Meter	Observed	1	14	7	22
	Expected	0.22	15.62	6.16	22
300 Meter to 400 Meter	Observed	0	8	4	12
	Expected	0.12	8.52	3.36	12
400 Meter to 500 Meter	Observed	0	19	4	23
	Expected	0.23	16.33	6.44	23
Total	Observed	1	71	28	100
	Expected	1	71	28	100

$$x^2 = 5.485, df = 8, p = 0.705$$

Source: Data collected from field (2011, 2014).

This box No. 1 the given for reason how to bad feel in industrial area and some problems facing in these area like eyes problems, dust partials, breathing, skin infection, bacteria, itching and unhygienic condition related to facing adjoin area are people are living.

Box No.1 : Reason for Bad Feel
<ul style="list-style-type: none"> ➤ Smells which creates problem to breathing ➤ Dust particles is eyes ➤ Hazardous smell due to garbage of leather tanning industry is ➤ Particles settles at door shops and needs regularly cleaning ➤ Most of the problems occur while breathing ➤ Skin infection and darkening of skins ➤ Chemicals and bacteria enters in to our body ➤ Itching and sores on skin of the body ➤ Problems due to unhygienic condition. ➤ Bought new house due to this problem

Source: Data collected from field (2011, 2014).

6.1. Effect on Human Health

A chi-square test was performed and no relationship was found between distance and effect on human health, X^2 (df=4, N=100)= 4.173, $p=0.38$ ($p<0.05$, at 5% level of significance). Therefore we have rejected the experimental hypothesis (H_a) and null hypothesis (H_0) is accepted.

Table 2: Distance and Effect on Human Health

Distance		Yes	No	Total
Up to 100 Meter	Observed	20	2	22
	Expected	19.36	2.64	22
100 Meter to 200 Meter	Observed	20	1	21
	Expected	18.48	2.52	21
200 Meter to 300 Meter	Observed	18	4	22
	Expected	19.36	2.64	22
300 Meter to 400 Meter	Observed	9	3	12
	Expected	10.56	1.44	12
400 Meter to 500 Meter	Observed	21	2	23
	Expected	20.24	2.76	23
Total	Observed	88	12	100
	Expected	88	12	100

$$x^2 = 4.173, df = 4, p = 0.383$$

Source: Data collected from field (2011, 2014).

Table no. 3 shows that on the effect of leather industry on health related mostly are affected to child about 77 percent than female about 69 percent affected and least affection on adult people about 25 percent the main reason of health problems the leather industry are used very harmful and hazardous chemical

Table 3: More Effect on Human Health

	Number	Percent
Child	68	77.3
Female	61	69.3
Adult	22	25.0
Total HHs.	88	100.0

Source: Data collected from field (2011, 2014).

In the box no 2 show that type are diseases, the different type of diseases like eye infection, bronchitis, stomach problems, skin diseases, diarrhea, itching, lungs problems and children related problems.

Box No. 2: Type of Diseases	
❖	Eye infection
❖	Bronchitis
❖	Stomach related problems
❖	Skin diseases/cancer
❖	Diarrhea
❖	Children related more diseases
❖	Itching and sores on skin of the body
❖	Lungs problems

Source: Data collected from field (2011, 2014).

A chi-square test was performed and no relationship was found between distance and any protection of diseases by leather industry, X^2 (df =4, N=100) = 6.426, $p=0.17$ ($p<0.05$, at 5% level of significance). Therefore we have rejected the experimental hypothesis (H_a) and null hypothesis (H_0) is accepted.

Table 4: Distance and any Protection of diseases by leather industry

Distance		Yes	No	Total
Up to 100 Meter	Observed	6	16	22
	Expected	8.36	13.64	22
100 Meter to 200 Meter	Observed	7	14	21
	Expected	7.98	13.02	21

200 Meter to 300 Meter	Observed	6	16	22
	Expected	8.36	13.64	22
300 Meter to 400 Meter	Observed	6	6	12
	Expected	4.56	7.44	12
400 Meter to 500 Meter	Observed	13	10	23
	Expected	8.74	14.26	23
Total	Observed	38	62	100
	Expected	38	62	100

$$\chi^2 = 6.426, df = 4, p = 0.17$$

Source: Data collected from field (2011, 2014).

6.2. Step for the Protection of Diseases Generate by Leather Industry

Investigation field survey results on the discussion basis leather industry are talk about for protection of diseases check out blow:

- Regularly tests should be holed.
- Money for the treatment gives by the industry.
- Leather industry should be providing medical facility and treatment.
- Timely test camp should be installed.
- Leather industry should be responsible for the cleaning.
- Consideration for cleaning.
- Regularly visit of doctor for consultation & treatment.
- Government should be identifying the diseases.
- Municipal Corporation and leather industry should take care of affected people.
- Regularly visit for test and medication.
- Specialized doctor for treatment of diherohea.
- New hospital should be opened.
- People with diseases should be identified.

7. Concluding Remarks

Thus, this research concludes at finding adverse impacts that leather industry have on its workforce, on neighboring population, on water system, and on environment in larger sphere. Despite there being numerous measures and government rules to control environment pollution, majority efforts have failed in one way or the other. Main cause behind these efforts generating unsuccessful results have been lack of administrative will in proper implementation of laws, which further makes situation more pitiable. To mitigate this big loss, a sound strategy is the need of the hour that will not only bring down its adverse impacts, but also work at improving total environmental loss by making environment protection 'a mandate to comply with' for leather industrialists. As we have seen in the present study that people employed in leather industry and living nearby are certainly getting affected from pollution created by it. In India, wherever leather industries are there, pollution level is very high. This proves a direct relationship between leather industry and pollution. According to reviewed literature, this is so because leather industry by nature is unable to fully end pollution, but it can certainly reduce it to a minimum level.

References

1. Abskharan, R.N.N., Rab, S.M.F.G.E., Hassan, S.H.A. and Shoreit, A.A.M. (2009), Reduction of toxic hexavalent chromium by E.coli, *Global Journal of Biotechnology and Biochemistry*, 4(2): 98-103.
2. Bhasker, P.J. (2000), Tannery Pollution and its effect on people life in Dindigul area, Dossier on tannery pollution in Tamil Nadu, Peace trust, Dindigul, Tamil Nadu, India, 195-197.
3. Cooman,K., Gajardo,M., Nieto,J. (2007). Tannery Waste water characterization and toxicity effect on *Daphnia* sp, *Environmental toxicology*, 18: 45-51.
4. CPCB (1999-00 to 2008-09), *Annual Report, Central Pollution Control Board*, Ministry of Environment & Forests, Government of India (online available at <http://cpcb.nic.in/annualreport.php>).
5. Dongre, N.N., Suryakar, N.A., Patil, A.J. and Rathi, B.D. (2010), Biochemical effects of occupied lead exposure to workers of North Karnataka (India), *Journal of Environmental Health Research* 10(1): 10-16.

6. Hasan, Kamrul (2011), Tanning Industry in India Environmental Problem: A Special Reference to the Kanpur Area, SHODH PRERAK A Multidisciplinary Quarter International Refereed Research Journal, Vol.-1 Issue-4.
7. Hasan, Kamrul (2013), Indian Tannery Labourers and Health Problems: Special Reference to the Kanpur and Unnao Area, Indian Journal of Social and Legal Study, January 2013, Vol. No.2.
8. Prasad, P. M. (2006), Environment Protection - Role of Regulatory System in India, Economic & Political Weekly, April 1, 2006, pp 1278-1288.
9. Rajamani, S. (2001), Tannery Waste Management & Technological Options for Up gradation of Environment System for Tanneries in Kanpur, Proceedings of Leather Research Industry Get-Together, Kanpur, Chapter, Aug 22, 2001
10. Sankar, U (2006), Trade and Environment- a Study of India's Leather Exports, Oxford University Press.
11. Sankar U (2006), Trade Liberalization and Environmental Protection- Responses of Leather Industry in Brazil, China and India, Economic & Political Weekly, June 17, 2006.

