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Occupational Health Hazards for Employees in the Leather Industry

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ABSTRACT: The leather industry is a long-standing industrial sector that produces a wide variety of products including bags, leather footwear, and clothes. The raw material utilized in the production process comes from food industry waste, notably from meat processing. This waste product is repurposed into appealing and practical leather goods. Leather as well as its derivatives are among the most widely traded commodities on the planet. They are made from a material that is both renewable and easily accessible. The main objective of this research is to occupational health hazards for employees in the leather industry. The current research focuses on the health risks faced by individuals who work in the tanning business or live near one. The findings demonstrate that the vast majority of respondents were suffering from Stomach pain, Kidney disorder, Vomiting, Respiratory disorder, Skin disorder, Lung problems, Swelling Eyes, and Headache, i.e., 64%, 30%, 52%, 60%, 50%, 57%, 73%, 95% of the people working in this industry respectively. In prospect, this paper help to understand the problem and disease caused due to working in the leather industry.

Keywords: Disease, Employees, Health, Lung Problem, Leather Industry.

1. INTRODUCTION

The meat sector relies heavily on leather production. The leather business delivers extra money for farmers, and creates employment, but also produces a renewable, durable, or usable material of established reputation by upcycling hides or skins instead of discarding them in open landfills. Tanning animal hides and skins into leather velong been a common industrial practice. For several causes, the tanning business has diminished in developed nations throughout time. At the same time, the tanning industry's qualities are ideally adapted to the demands of growing economies: high labor intensity, raw material availability, and high added value. By tanning hides and skins, the leather business helps to reduce waste caused by the meat industry, as well as decrease the price and increase the availability of meat, which aids in the fight against malnutrition. In any case, there are certain obstacles to overcome to completely realize the rewards of the sector. Occupational Safety and Health are one of them (OSH) [1]–[3].

The leather industry is often used to generate thousands of employment and earn foreign exchange in developing nations; however, OSH standards are inadequate due to a lack of structures, organization, and expertise. To safeguard employees and the employment that tanneries produce, extra attention must be paid to increasing awareness of the dangers and hazards associated with the leather-making process, as well as continuously improving workplace conditions and safety requirements [4], [5]. The fundamental reason for all this is, of course, to safeguard human health or life, which is of paramount significance in any human activity, including, in this instance, in a well-managed sustainable company. Furthermore, any mishap or irregularity in tanneries may tarnish the public's opinion of leather enterprises by projecting an image of deplorable circumstances in an underdeveloped sector. To safeguard lives, the employment produced, the industry's reputation, and its ambition to be a source of solutions rather than problems, it is in the best interests of the whole leather sector to maintain the highest possible standards of health or safety in tanneries [6], [7].

One of the earliest materials employed by man to suit his requirements was leather. While it was originally employed for covering reasons, it became a strategically essential material in conflicts as a stirrup, scabbard, or quiver. The product of the leather business is unprocessed components for the steers industry. Crude leather is among the most important byproducts of meat growth. The everlasting cowhide merchandise sector, according to a few businesses, has its unique characteristics or qualities. Leather uppers or cowhide products are among the most widely traded goods on the planet, and they are made from an endless and plentiful resource. International commerce is anticipated to be worth

more than 80 billion dollars each year, and with the rising influx of people, developing or emerging nations are likely to continue to join [8].

Given the area's prominence, its logical collaboration with a variety of sectors is immediately apparent. Numerous logical studies have been conducted in this domain, which is crucial for disciplines such as creature culture, science, executives, money, financial concerns, or showcasing. The goal of this research is to look at works in business sciences including sub-disciplines besides livestock and chemical that deal with the sector scientifically. For the sake of this post, we'd want to look at not just what occurs at a tannery from rawhide to completed leather, but also the lengthy trip from raw material to the final product (handbags, car seats, or shoes), as well as the disciplines required along the way [9], [10].

On a global basis, the leather industry is a big sector with enormous economic significance. The tanning business has been criticized for its environmental impact, and it is thought to be a significant cause of water contamination. Tannery squanders are known as a movement that causes mixed character contamination since both natural or inorganic fixes are present in greater quantities than in other squanders. As a result, tanneries are likely to produce an effluent with a reduced natural effect. The amount and characteristics of toxins produced by different tanning activities, as well as the many therapy approaches available, are examined. They might be combined to create the foundation of cutting-edge technology for the treatment of tanning business effluents. The leather or leather goods industry has been highlighted as one of the few that offers both value addition and export opportunities. Apart from employment, this industry makes a substantial contribution to the country's overall industrial production and exports [5].

The extensive variety of chemicals, apparatus, equipment, or procedures used in the tanning business may offer several occupational hazards as well as substantial dangers to employees, particularly in countries where police departments are weak. Poor safety management, a lack of know-how, a lack of training, or a lack of awareness of the hazards that might arise during leather manufacture are common in such nations. As shown in Figure 1, the goal of leather safety is to provide safe leather for employees, the community, including users. Many tanneries fail to implement enough preventative or protective measures to enhance OSH standards, putting their workers in danger. It has been established that general safety standards may be improved for little or no cost if a little effort or goodwill is put out [11].

Figure 1: Illustrate the concept of worker safety in the leather Industry. Leather safety aims to provide safe leather for employees, the community, as well as users [12]**.**

1.1. Tannery Effluent's Effects on the Environment or Human Health

Environmental pollution is among the world's significant issues, and it is worsening every day as a result of urbanization and industrialization. The present industrial activity pattern disrupts natural material flow or introduces new chemicals into the environment, which includes water bodies, plants, soil, vegetables, humans, and other living organisms. Water pollution is now one of the most important problems confronting the contemporary world, as a result of a growth in the number of companies, and this is a source of other environmental pollutants. Soil and air, after water, are the most crucial components of the ecosystem, yet they are also the most underestimated, misunderstood, and overused earth and atmospheric resources. Soil pollution has become a severe issue in all of the country's industrialized regions. The ultimate sink for organic or inorganic contaminants emitted into the environment from the effluent is seen

as soil. For their continued growth and development, many animals and plants rely on the soil as a growth substrate. Contamination of soils with phytotoxic amounts of heavy metals or micronutrients has negative consequences not just for plants, but also for human health. The metal buildup has an impact on plant development and metabolism, as well as the formation of reactive oxygen species [13]–[15].

Despite the leather industry's significant economic impact, improper disposal of the tannery waste materials, gaseous emission, and the release of tannery wastewater containing hazardous chemicals such as Chromium (vi) compound, synthesized tannins, oil or grease, resins, biocides, or detergents tarnishes the industry's image. Furthermore, excessive levels of COD, BOD, or PO4 in the leather sector have been linked to eutrophication in the aquatic environment. To save the leather industry's reputation, comprehensive techniques that promote the decrease of pollutants while recovering solid waste are critical. Figure 2 depicts pollution control comprehensive techniques and the consequences for the ecosystem if no waste management controls are implemented.

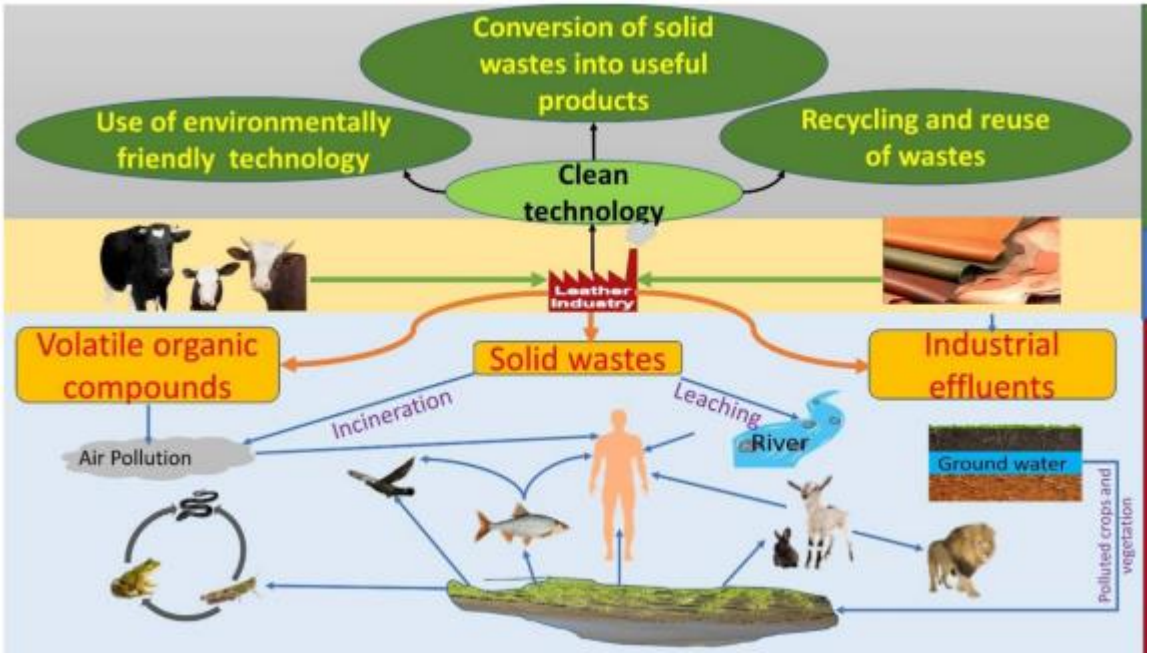

Figure 2: The leather company's environmental effect or technologies to mitigate the danger [16]**.**

The tannery industry is most polluting because of the extensive range of chemicals used in the transformation of animal skins to leather. In tannery effluent, chromium salts, tannins, phenolics, and organic matter, along with many other compounds, are regularly released into the environment. These contaminants pose a threat to aquatic life as well as human health. The influence and residues of high concentrations of NH_4-N or Geon on the local ecology including human health have been identified in China. Organic debris in effluents contains both pathogenic and non-pathogenic microorganisms**.** There are around 4,000 tanneries in India, the majority of which (almost 80%) use the chrome tanning method. Figure 1 depicted the health concerns associated with this product, which were mentioned by several writers. Brazil is also a major supplier of tanned blue leather. Many attempts have been made by many nations to reduce environmental or human health concerns since this activity is extremely vital for the economy, as well as the beneficial effects of such initiatives, were shown throughout the discussion portion.

1.2. Impact of the Leather Industry on human health:

Tannery waste pollutes the land, air, and water, resulting in major health issues. Exposure to such a polluted environment has been linked to a variety of diseases, including asthma, hepatic dermatitis, and neurological illnesses, as well as numerous cancers. The majority of studies to date have found that tannery employees workers exposed to chromium (either in chemical or protein-bound form) increase their risks of dermatitis, ulcers, or respiratory disease.

1.3. Tanneries that are good for the environment:

Measures comparable to the Kasur Tanneries Pollution Prevention Project should be done to analyze pollutant levels and implement pollution control measures. Cities with a large concentration of leather industry should have a separate agency to handle the disposal, safe drainage, or collection of tannery effluent. To avoid exposing these communities to industrial waste, tanneries should be located as far away from population centers or residential belts as practicable. To

guarantee that effluent water does not mix with the drinking water supply, extreme caution, and preparation are required. To prevent the trash from being discharged into uncontaminated resources, effluent treatment facilities and solid disposal of wastes should be built near the leather industry. Environmental Education is the study of the environment [17].

Any effective was disease-preventive and therapeutic program relies heavily on patient education. It is critical to inform employees and citizens in the surrounding regions about the potential health risks posed by leather tanneries. Because literacy in underdeveloped nations is often poor, instructional programs of this kind must be written in basic language so that the general public can understand them. The significance of correctly handling, forcefully washing, meticulously sifting, and completely boiling food should also be emphasized since incorrect procedures in this area might result in the persistence of certain poisons in food.

1.4. The leather firm's prospects concerning chromium contamination:

The leather company's prospects about chromium contamination. Leather is one of the most traded commodities on the planet, ranking in the top 25. The total annual global leather production is projected to be 24 billion square feet, with the leather shoe sub-sector responsible for 65 percent and the remaining 36% going to various other leather products. The global leather goods market was estimated at USD 415 billion in 2017, with a CAGR of 5.4 percent projected from 2018 to 2025. The major drivers of industrial growth include rising disposable income, rising living standards, and changing fashion trends, but more domestic or international tourists.

2. LITERATURE REVIEW

Subodh Kumar Rastogi and Amit Pandey studied Work-related health risks among the workers employed in leather tanneries at Kanpur. The authors selected 197 male employees from various departments of 10 leather industries in Kanpur for cross-sectional research to examine health hazards. A control group of 117 male individuals of comparable age and socioeconomic status who had never worked in the leather tanneries was also evaluated for comparison. The author of this research compared the controls and the exposed employees and found that the exposure had a considerably greater rate of morbidity, according to the data (40.1 percent vs. 19.6 percent). They found that respiratory illnesses (16.7 percent) were the leading cause of morbidity among exposed employees, while gastrointestinal tract issues were the most common in the control group. They also found that the exposed group's urine and blood samples had considerably higher concentrations of chromium, indicating a larger body load of chromium inside the exposed employees as a consequence of high concentrations of ambient chromium at the workplace [18].

Shilpy Rani Basak et al. investigated Professional Health or Safety Standards in the Bangladeshi leather Production Process. The authors stated that to effectively enhance the Occupational Health or Safety condition in the businesses, certain particular targets for owners and employees should be defined. Employees and employers are both unaware of certain rules, regulations, and moral duties, which is a primary source of workplace accidents. According to the study, the minimum treatment expenses for an injured worker vary from 0.05 to 0.2 million BDT, which is 9 to 36 times more than the yearly PPE expenditures. Though changing a long-standing practice or habit is difficult, it is past time to tackle the issue to compete in the global market with global standards. The cost of fostering a good working atmosphere and attaining OHS compliance affects production costs, but it's important to remember that a good workplace with knowledgeable, safe, or healthy personnel pays off in the long run [19].

Mahamudul Hasan MD et al. studied the incidence of health risks by examining various illnesses among tannery employees. A cross-sectional study of tannery workers in the Hazaribagh industrial area of Dhaka was conducted from May to July 2016. For information, 276 tannery workers from different tanneries in the area were questioned. Face-to-face interviews were conducted using a questionnaire and trained medical students were utilized to determine the skin problems of the personnel. Gastrointestinal disorders (71.7%), asthma (49%), high blood pressure (52.2%), diarrhea (71.7%), and eye disorders (46.7%) were determined to be the most prevalent ailments. Scabies (73.9%), urticaria (59.7%), nail discoloration (69.6%), miliaria, and folliculitis (56.5%) were the most prevalent skin diseases. The diverse leather-processing work conditions and the poor PPE (personal protective equipment) usage are closely connected with the high sickness incidence among tannery personnel [20].

Research Questions:

- What health problems are associated with working in a leather factory?
- What are some of the ecological, emotional, and physiological problems that the leather business has caused?
- What is the extent of the leather industry's pollution?
- Why is leather a non-renewable resource?

3. METHODOLOGY

3.1. Design:

The primary goal of the planned research is to conduct an inquiry into the environmental and health concerns that have arisen as a result of the tanning industry's harmful effluent emissions. The following are the study aims and hypotheses to achieve this goal:

3.2. Sample:

For the chosen research, convenience sampling was employed as a sample strategy. Respondents or samples were gathered from various locations. The authors of this article used a sample size of 500 people who answered, which are shown below by age groups, genders, and other factors.

3.3. Data collection:

The data for this research came from a primary source, an online survey with a variety of questions. Primary data is acquired directly from leather industry respondents, as well as data from people in the area around the leather sector through an online poll.

Table 1: Illustrate the Respondents based on Gender.

Gender	No. of Respondent	Percentage
Male	260	52%
Female	180	36%
Other	60	12%
Total	500	100

Table 2: Illustrate the Respondent based on based on Age Groups.

Age Group	No. of Respondent	Percent
20-25	125	25%
25-30	195	39%
30-35	180	36%
Total	500	100

Table 3: Illustrates Disease Caused by Working in Leather Industry.

Name of Disease	No. of Responded
Stomach Pain	320
Skin Disease	250
Head Ache	470
Kidney Disorders	150
Vomiting	260
Respiratory disorder	310
Lung's problem	285
Swelling In Eyes	365

3.4. Data Analysis:

In this paper, the author discusses the worker facing problems in the leather industry. Table 1 show out of a 500 sample size 52 % of male give a response and 36 % of female give a response based on Gender. From Table 2 out of 500 respondents, 25 % of the respondent in the 20- 25 age group, 39 % of the respondent in the 25 to 30 age group, and 36 % of respondent belong to the 30-35 age group. Table 3 shows the various disease caused due to working in the leather industry such as skin disease, Respiratory disorders, vomiting, lungs problem, etc.

Examine and analyze the numerous factors that have an impact on the health of the people exposed to the Tannery business and its waste. Exposure to tannery waste disposal and tannery employees has very detrimental long-term effects on the human body. The new research is based on a survey of people who live near tanning salons and those who work in the sector. People who worked in or lived near the tanning industry responded. The respondents' views of

their health concerns are the basis for this research. As a consequence, the responses are grouped in the tables above. The study's emphasis is on the disease profiles of respondents who work in the tanning industry and live near it, including those who do not work in the tanning industry yet live near it.

4. RESULTS AND DISCUSSION

The sickness induced by working in the leather industry is shown in Figure 3. Working in the leather business may lead to a variety of illnesses, including (Stomach pain, Kidney disorder, Vomiting, Respiratory disorder, Skin disorder, Lung problems, eye Swelling Eyes, Headache, etc.) Out of 500 participants who responded to the study, 64 % said they were suffering from stomach aches. 30 % of those polled had a kidney issue, and 52 % of those polled had a vomiting problem. Sixty percent of those polled said they had a respiratory ailment. Skin disorders affect 50% of the population. In a survey of 500 respondents, 57 % said they had a lung issue. Swelling of the eyes affects 73 % of the 500 respondents. And, of the 500 persons who responded, 95% of them suffer from headaches. The authors of this poll received responses from persons who work in and live around the leather industry.

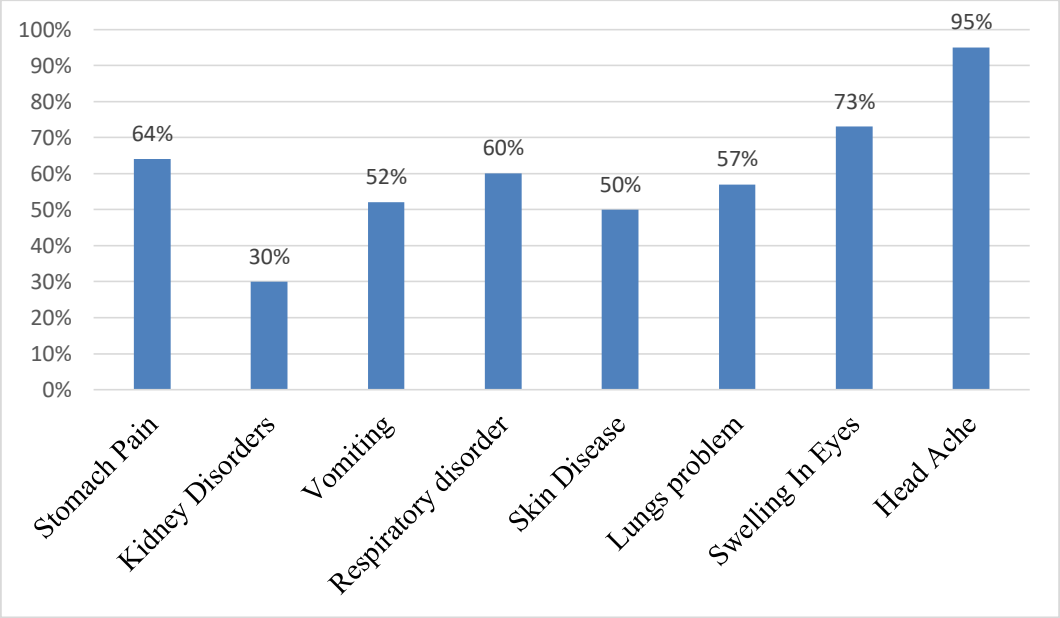

Figure 3: Illustrate that working in the leather industry causes disease.

Many variables may affect the health of leather manufacturing employees. It was discovered that the health state of industry employees differed from males to women. Their well-being is also affected by their age, the sort of job they do, their socio-demographic profile, the manufacturing facilities available to them, the length of time they labor there, and the environment in which they work. The wellness of leather manufacturing employees is thought to be influenced by the elements listed above. In prior research done at the same time, we simply documented the morbidity pattern of leather workers and investigated the relationship between their social-demographic profile as well as their morbidity.

5. CONCLUSION

All of the disorders mentioned above are more likely to manifest as a result of heavy metal ingestion, including Chromium, which is a frequent tannery effluent. Workers exposed to chromium, which itself is utilized as a fundamental tanning pigment, is a significant health potential risk for tannery employees. Because it involves dealing with chemicals, employment in the leather distribution chain is dangerous.

Toxic substances have a significant detrimental effect on the health of tannery workers. Fever, eye irritation, skin disorders, and lung cancer are all common among tanning workers. Because tanneries often disregard basic health and safety norms, through use of chromium typically indicates major human and labor rights abuses. In addition, hazardous fumes are diffused by the colloidal suspension effluent of leather manufacture. When it comes to harmful gases, leather workers are often unprotected.

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