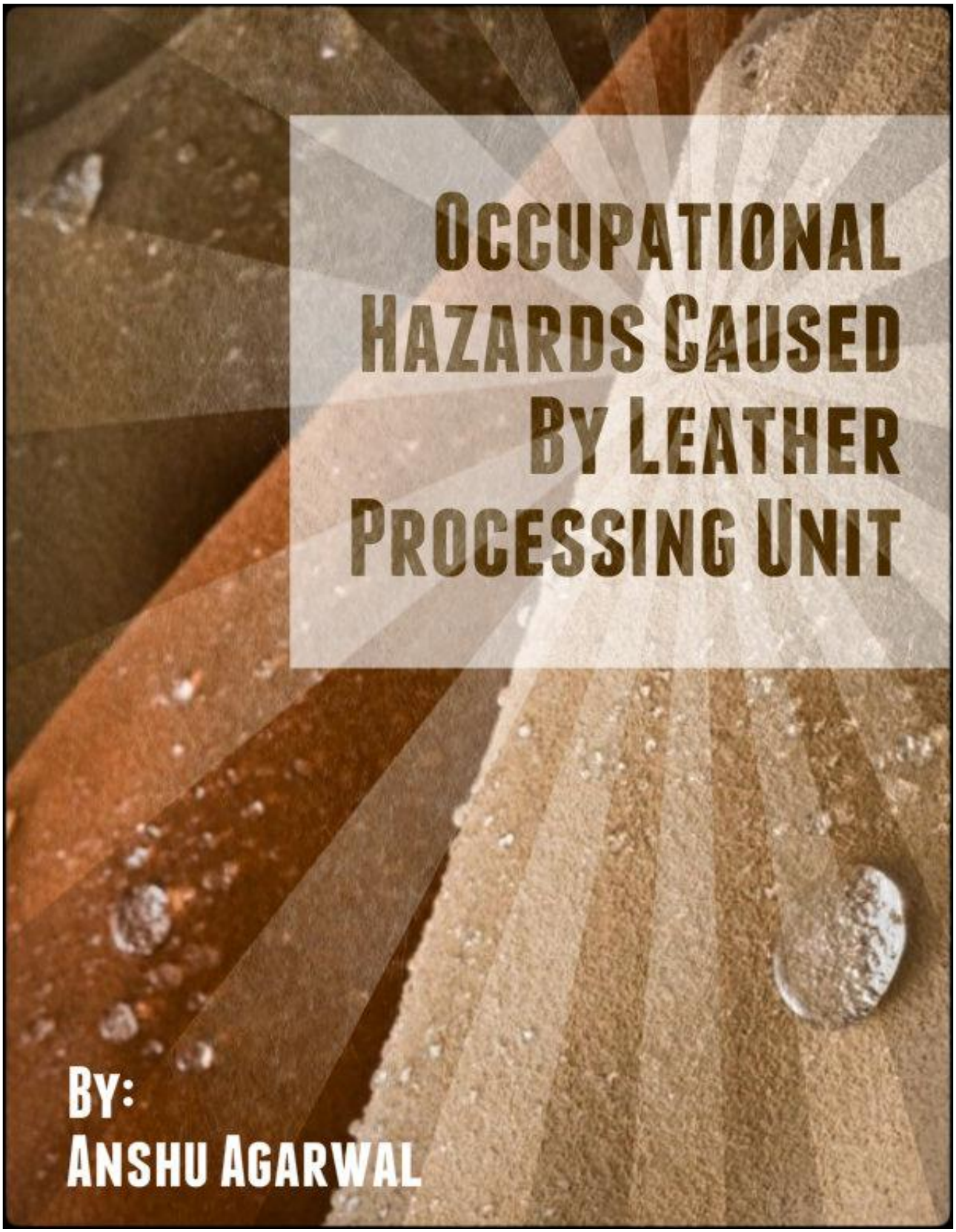
OCCUPATIONAL HAZARDS CAUSED BY LEATHER PROCESSING UNIT
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Abstract:

This study was undertaken to study the occupational hazards and problems faced by workers; working in leather processing units of Jaj-mau, Kanpur. A descriptive research design was planned using survey and questionnaire method. Random sampling technique was adopted to select sample of 15 leather manufacturing units through lottery method, sample also included 75 workers.

The result highlighted the fact that detrimental work practices in leather processing units without the use of protective clothing resulted in various types of physical, chemical, ergonomic, biological problems. The major problem faced by workers was irritation in skin which comprised of dryness of skin, cracks, itching owning to the exposure of chemicals. Shoulder pain comprised of pain, stiffness, pain in hand and elbow due to the activity performed.

Introduction:

Leather has played an important role for the development of civilization. From a very older time men had used animal skin to satisfy their basic needs. They had used animal skin to make clothes to protect their body from cold days of winter and hot days of summer. Besides clothing they had used hides in making carpets, shelter, and decorative attire. Now a day's leather is used to make hand-bags, key-chains, wallets, purses, passport-holders, jackets, belts, mobile-pouches, hats, shoes, chappals, briefcases etc.

The leather industry is one of the oldest industries known to mankind. Our earliest ancestors used skins to protect their body. Leather is made form the skin of animals, reptile, birds, fish; through a process known as tanning. Leather can be made by any animals' skin but cow has the thickest skin to make strongest

Leather is obtained from animals' skin i.e. cow, goat, buffalo, horse, deer, fishes and birds. The hides and skins of animals are the source of leather. The skins of large animals such as cattle and horses are referred to as hides. Those of smaller animals such as sheep, goats and calves are called skin.

In recorded history, pieces of leather dating from 1300 BC have been founded in Egypt. Primitive societies in Europe, Asia, and North America all have developed the techniques of turning skins into leather goods independently of one another.

After some time, by accident or by trial or error, man discovered method of preserving and softening leather by treating animal skin with such things as smoke grease and bark extracts. The art of tanning leather using the bark of trees probably originated among the Hebrews. The leather art was a closely guarded secret passed down from father to son.

Having reviewed the available literature the investigator discovered a dearth of database researches carried on such burning issues that are of high concern to the government. As a result the researcher got inclined to take an initiative to probe in the government concerning need based subject. The work, therefore, will be answered to exotic and destructive development of leather processing sectors. Hence there was a felt need of reliable records focusing on various aspects of leather processing units including technical aspects and health problems of the workers in these units.

Methodology:

A descriptive design was planned using preliminary survey and questionnaire method. To gain holistic information of the functioning and existing status of leather processing units of jaj-mau, purposive random sampling technique was adopted for present investigation and to select respondents.

Of total leather processing units a sample size 10% (i.e. 15 units) which accounts 75 workers (i.e. 5 workers from each selected unit) were drawn to study the techniques of leather processing and health status of the workers.

The obtained data was presented in terms of percentages, frequencies and tabular form.

Result & Discussion:

Finding of investigation as obtained in analysis of data using survey, observation and questionnaire are described and discussed under following heads: technical information of the units, process of making leather from animal skin, health problems of the workers within the unit.

Technical information of the unit:

The data regarding the area covered by the area covered by the unit revealed that majority 46% of the unit covered 400-600 sq. ft area followed by 34% units covered the area of 600-800sq.ft and 20% units covered more than 800 sq. ft area in Jaj-mau. The finding further indicated that 40% of the units had an initial investment of ₹40-50 thousand, values of data regarding the existing capital investment is showed in table no.1

Table-1: Distribution of the units according to the capital employed:

Capital value	Number of units (n)	Percentage (%)
40000-50000	6	40
50000-60000	4	26
More than 60000	5	34

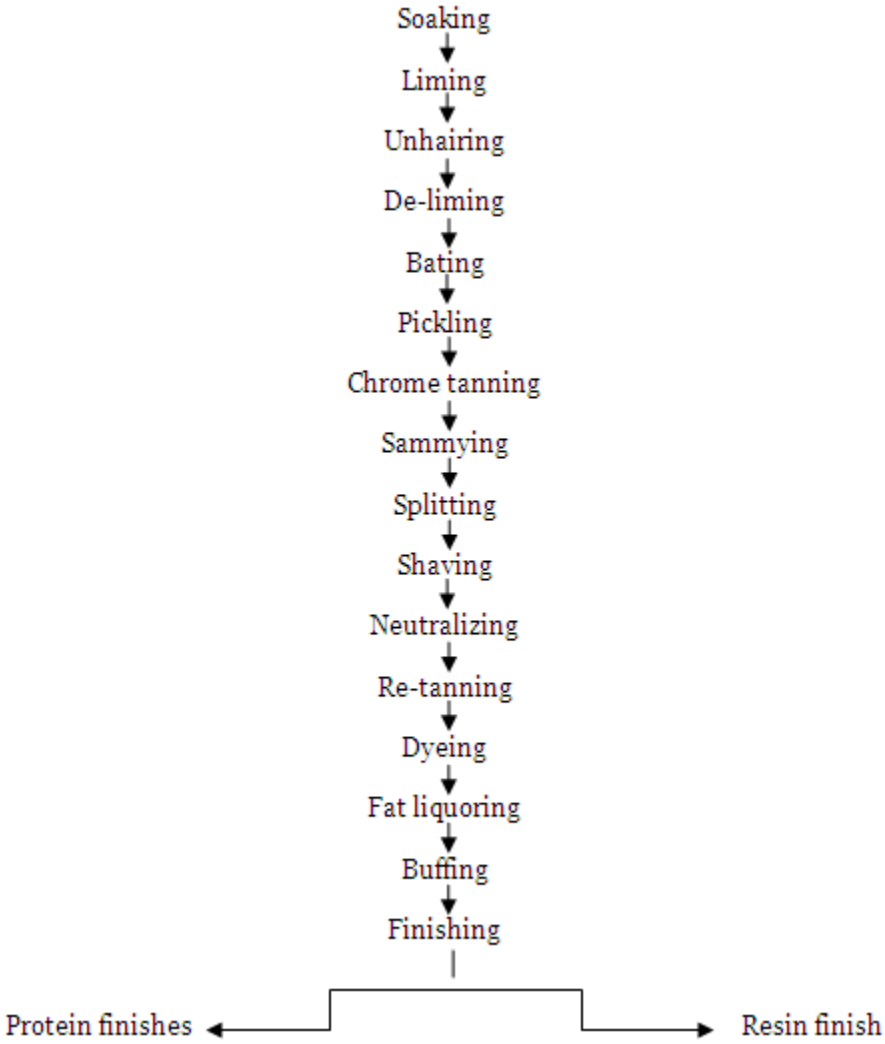
This shows most of the units invested very low amount because most of the units in Jaj-mau are small scale unit.

Table-2: Distribution of the units according to the form of raw material:

Form of raw material	Frequency (n)	Percentage (%)
Wet blue (Preserved animal skin with Na_2CO_3 for six month	4	26
Animal skin	11	74

The given data showed that most of the units preferred animal skin as a raw material because animal skin is available in low cost in comparison to wet blue.

The leather making process:



In soaking hides and skins in wet or dry salted condition are brought for soaking after sorting into different grade, size and quality. Main objective of soaking is to rehydrate the cured skins and hides to green condition and also to remove salt, dung, dirt, blood. It is done over night with 2-3 change of water. After soaking; liming is done with an intention to remove hairs, fatty substance present in hides and skins. It is done to ensure swelling and pumpling of protein fibers present in hides and skins. But lime alone is not sufficient to remove hairs so sharpening agent like sodium sulphide (Na_2S) and old lime liquor is used to achieve desired effect. But modern tanners prefer to follow short and sharp liming by using drums and paddles instead of liming pits. After liming the hides and skins are called pelts. The pelts are then un-haired fleshed and scud mechanically to obtain clean pelts. De-liming is carried out to remove the alkali introduced during liming operation and to bring down the swelling pumpling of pelts to desired level. In order to remove free lime from pelts, the pelts are washed in drum with

running water for 15-30 min. Batting is generally done on goat skin. The main objective of batting is to obtain a smooth and silky grain of final leather. Now pickling is done to bring pelts in proper pH i.e. below 3 for chrome tanning operation. Chrome tanning is done to convert putricible hides into imputricible leather. In vegetable tanning; babul. Wattle, myrobolan is used while in mineral tanning chromium, zichromium or alums are used. The mineral tanning has gained popularity by using 33% basic chromium salt. Now sammying process takes place to reduce water content from leather. After sammying process; splitting process carried out to reduce the thickness of leather. The top layer is called grain split and bottom layer is called flesh split. Now shaving process takes place. It is done to get exact thickness of finished leather. After this; neutralization process takes place in which shaved leather is washed in running water to remove free acid present in leather. Mild alkalis and auxiliaries are used to bring leather to right pH condition by removing extra positive charge. To impart other requisite properties in leather, leather is re-tanned by using by using vegetable and mineral tanning material. Leather has a particular color after particular type of tanning. For example, the color of chrome tanned leather is greenish blue and color of vegetable tanned leather is light brown. After this fat-liquoring operation is carried out by using oil (vegetable and animal) and emulsion to lubricate leather by making it soft and water proof. Buffing operation is carried out to remove excess flesh adhere to the flesh side of leather. Leather is then toggled and nailed to remove stretchiness. Now leather is finished in order to enhance aesthetic appearance and also to cover natural and other defects like scratch mark, pox mark, flay cuts and bacterial damage. This process makes leather water repellent. Protein finish is given to high quality leather using protein binder, wax emulsion, sye solution while resin finish is given to enhance market value of defective leather. In resin finish resin binder, penetrator emulsion and wax are used.

Profile of the workers:

Most of the workers were male and belong to Muslim community. Data pertaining to educational qualification of the workers revealed that 35% attained primary education rest attained secondary and senior secondary education. (Table-3)

Table: 3 distributions of the workers according to demographic details

Details	**No. of workers (n)**	**Percentage (%)**
Age group		
20-30	24	32
30-40	45	60
40-50	06	08
Gender		
Male	54	72
Female	21	28
Religion		
Hindu	27	36
Muslim	48	64
Education qualification		
Primary	26	35
Secondary	38	50
Senior secondary	11	15

The results also revealed the age of most of the workers is 30-40 and age of minimum workers is 40-50. The workers 30-40 years of age were permanent as stated by the owners of the unit.

Health aspect of the workers:

Data analysis regarding the health problems faced by the workers as observed in Table-4 show that workers usually suffered from skin, hand, shoulder, back pain, central nervous system (headache), cardio vascular and lower limb problem.

Major problems related to skin were dryness, itching, cracks caused due to the exposure to chemicals. Shoulder problem comprised of elbow, hand, wrist pain followed by stiffness due to the activity performed during the leather processing work. Stressful and long working duration cause pain in joints and legs.

Table-4 Problem faced by the workers owing to various occupational hazards:

Occupational hazards	Always		Sometimes		Never	
	(n)	(%)	(n)	(%)	(n)	(%)
Headache	32	43	17	23	26	34
Irritation in eyes	43	57	25	33	07	10
Neck pain	37	49	20	27	18	24
Waist pain	21	28	36	48	18	24
Shoulder pain	24	32	30	40	21	28
Elbow pain	18	24	30	40	27	36
Hand pain	34	45	36	35	15	20
Wrist pain	27	36	33	44	15	20
Finger pain	24	32	30	40	21	28
Irritation in skin (itching, cracks, dryness)	30	40	27	36	18	24
Leg pain	36	48	24	20	24	32
Back pain	27	36	15	20	33	44
Tuberculosis	00	00	21	28	54	72

Foul smell of different chemicals and animals skins were the exposure which were faced by the workers in leather processing units. Besides this poor ventilation and low ceiling problems were also faced by the workers.

The given data in the table-4 show back, leg, and headache related problems were majorly faced by the workers. These problems were due to the long working duration, poor working condition and wrong posture. Due to the exposure of chemicals little number of workers had also suffered from Tuberculosis. To protect themselves from exposure to chemicals, use of safety aids done by workers can be seen in table-5.

Table: 5 distributions of the workers according to the use of safety aids:

Safety aids	Always		Sometimes		Never	
	(n)	(%)	(n)	(%)	(n)	(%)
Gloves	00	00	03	04	72	96
Masks	00	00	00	00	75	100
Ear-Muffs	00	00	00	00	75	100
First-aid	30	40	40	53	05	07

Table: 5 shows no worker use gloves always while performing leather processing work. Only 4% worker use gloves sometimes and 96% never use gloves. As a result they suffered form different skin problems i.e. itching, cracks etc. Result also revealed that 40% of the workers used first-aid followed by 53% workers used sometimes first-aid facility and 7% never used first-aid. Because of a little use of safety aids workers were suffering from various skin disease.

Conclusion:

To conclude it can be said that leather of Kanpur has a charm of its own. The units however have a bright future because of increasing demand of leather and its product. The outcome of the study shows that leather of Kanpur (jaj-mau) is the oldest leather units. The manufacturing process is very much alike. More changes have come up with the passage of time. Nowadays different chemicals are used to prepare leather from animal skin quickly.

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