

Profile of the leather processing/ and production units of Kanpur

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■ **ABSTRACT :** The Indian Leather Industry comprises of major segments namely Footwear, Finished Leather, Leather Goods, Leather Garments, Footwear Components and Saddlery and Harness. All these segments have high growth potential. The leather units of Kanpur are renowned for high quality leather products and realistic pricing. The researcher selected 9 leather processing/ and production units of Kanpur city from different areas of Kanpur city for conducting survey work. The study was conducted with the objective to investigate the profile of leather processing and/ production industries of Kanpur city.

■ **KEY WORDS:** Profile, Leather, Processing, Production, Industries, Kanpur

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Leather industry occupies an important place in Indian economy in terms of its immense potential for employment, growth and exports. The sector is spread across the formal as well as informal sectors and produces a comprehensive range of products from raw hides to fashionable shoes (www.indianmirror.com). The leather industry holds an important place in the economy of India. As India is the world's second largest producer of footwear and leather garments, the leather industry is among the top ten foreign exchange earners for the country. Over the past century, the Indian leather industry has undergone a significant change from concentrating on exports of raw skins and hides towards exporting finished, value-added leather products (www.indianet.nl). Kanpur is popularly known as the "Leather City of the World". Huge amounts of leather products are shipped to New Delhi and other major cities

in India by the Kanpur leather traders. Leather industry can be broadly divided into Leather Processing and Leather Product Industry.

The leather processing involves two stages (www.indianmirror.com),

- Tanning: Processing of raw hides/skins into semi-finished leather
- Finishing: Processing of semi-finished leather to finished leather

Kanpur is well known global hub of leather industries. There are saddler and equestrian goods exporters, shoe and shoe components manufacturers and exporters as well as producers of finished leather, leather garments and leather accessories.

Tanning industry is a highly polluting industry. Tanning is the process by which raw animal hides are converted into leather. The leather is made resistant to

biological decay by stabilizing the collagen structure of the hide, using natural or synthetic chemicals (UNEP 1991) (<http://s3.amazonaws.com>). The study was conducted with the objective to investigate the profile of leather processing and/ production industries of Kanpur city.

■ RESEARCH METHODS

Locale and sample selection:

For the present research work, Kanpur city was chosen by the researcher because it is one of India's most polluted cities, and third largest tanning center in India. In order to select the leather industries, a list of leather industries (leather processing, leather product manufacturing and leather processing and production industry) was procured from District Industries Centre Kanpur, which have been registered since last 20 years. Purposive random sampling technique was adopted for present investigation and to select respondents. In total, 3 units each among leather processing or/and leather product manufacturing units, situated in Kanpur city were purposively identified and selected, thus a total sample of 9 leather industries formed the part of the sample. The respective head of the selected leather industry were interviewed to study the profile of the selected leather industry.

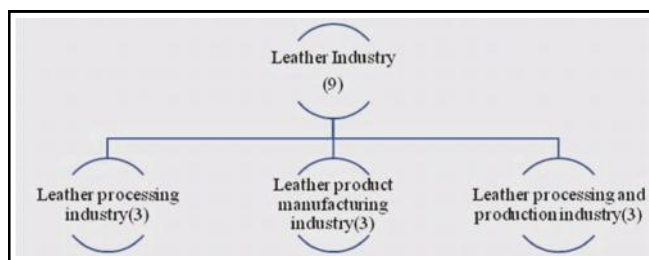


Fig. A : Sample selection

The survey method was used to get desired information about the leather industries of Kanpur.

Development of tool:

Structured interview schedule:

For studying the profile of leather industries and functioning of Common Effluent Treatment Plant (CETP), a structured interview schedule was developed to gain information from the respondents *i.e.* Head (Manager/Director) of the Leather industries, regarding the profile of both leather processing and leather product

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

■ RESEARCH FINDINGS AND DISCUSSION

Finding of study as attained in analysis of data using survey, observation and Interview schedule has been presented which includes the general information of leather industries selected as sample of the study in terms of their location, unit size, area covered, total capital investment, total production per year, yearly turnover, type of workers, size of unit, wages of workers, protective equipment used, marketing of the product etc.

Profile of leather industries:

Location:

The researcher selected 9 leather processing/ and production units of Kanpur city using purposive random sample technique from different areas of Kanpur city for conducting survey work. Data in Fig. 1 clearly shows that 55.55 per cent of leather processing/ and production units were selected from Jajmau area of Kanpur due to higher concentration of leather processing/ and production units in that area. Rest of the industries were selected from district industry centre, Kanpur as shown in the Table 1.

Table 1 : Percentage distribution of leather units by its location (n=9)

Location Area of Kanpur	Frequency(f)	Percentage (%)
Jajmau, Kanpur	5	55.55
Shyamnagar, Kanpur	2	22.22
Karamcharinagar, Kanpurnagar	1	11.11
Magarwara, Unnao, Kanpur	1	11.11

In Kanpur, the number of tanneries had doubled over the past 15 years. Most of the tanners in Jajmau area has expanded their production capacity. Initially they started only with leather tanning. Almost 50 per cent have expanded to produce some type of leather goods. In addition to increasing the production of leather, more tanneries are now also making leather components and products, for example, shoe uppers or shoes, bags, saddlery and harness goods (Schjolden, 2000).

Year of establishment:

The data about year of establishment of selected leather processing/ and production units have been presented in Fig. 1. It was found that an equal percentage

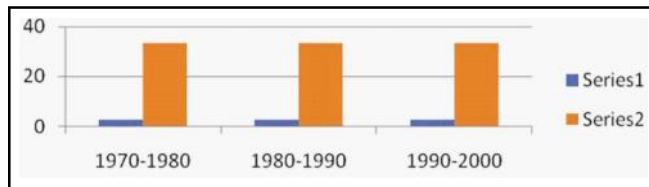


Fig. 1 : Percentage distribution of leather units by their year of establishment

(33.33%) of leather units were established in the year 1970-1980, 1980-1990 and 1990-2000, respectively.

Area covered:

Data in Table 2 and Fig. 2 highlights the total area covered by selected leather processing/ and production units. A perusal of table indicates that an equal percentage of leather processing/ and production units (22.22%) covered the area between 500-600 sq/ft, 900 sq/ft and 4-5 acre, respectively, while 33.33 per cent leather processing/ and production units were spread between 600-800 sq/ft.

Total area covered	Frequency(f)	Percentage (%)
500-600 sq/ft	2	22.22
600-800 sq/ft	3	33.33
900 sq/ft	2	22.22
4-5 acre	2	22.22

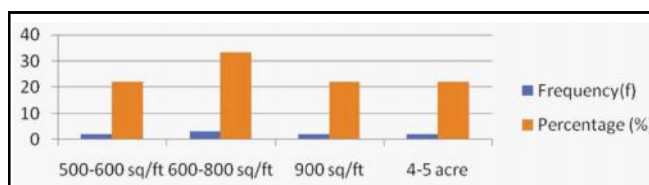


Fig. 2 : Percentage distribution of leather units by total area covered

Size of the unit:

Perusal of Table 3 clearly shows the size of the unit of selected leather processing/ and production units. Majority of the leather units (55.55%) were of medium

Aspects / variables	Frequency(f)	Percentage (%)
Small scale	2	22.22
Medium scale	5	55.55
Large scale	2	22.22

scale by its size followed by an equal number of units (22.22%) in both small- and large-scale categories, respectively.

Total capital investment:

Money is invested in a business venture with an expectation of income and recovered through earning by the business over several years. Capital investment may also refer to a firm acquisition of capital assets on fixed assets such as land, machinery or buildings rather than used to cover the business day to day operating expenses. Data in Table 4 and Fig. 3 shows 33.33 per cent leather processing units had made an investment of Rs. 1-4 crore, followed by 4-6 crore by 33.33 per cent leather production units. Remaining 33.33 per cent units involved in both leather processing and production had invested a huge amount between Rs. 10000-20000 crore.

Total capital investment (In crore)	Frequency (f)	Percentage (%)
1-4	3	33.33
4-6	3	33.33
1000-20000	3	33.33

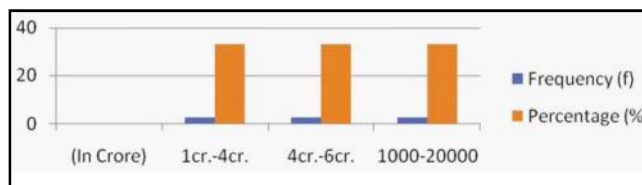


Fig. 3 : Percentage distribution of leather units by total capital investment

Production per year:

Production involves the processes and methods employed to transform tangible input and intangible input into goods and services. Table 5 shows the frequency and percentage distribution of selected leather processing/ and production units by production per year. The data regarding the production per year in terms of

Total production per year (approx. pieces)	Frequency (f)	Percentage (%)
According to order	2	22.22
50,000- 1,00,000	4	44.44
1-2 crore	3	22.22

pieces revealed that majority of leather units (44.44%) had production of approximate 50,000 to one lakh pieces followed by an equal number of leather units (22.22%) whose production is based according to order received and between 1 to 2 crore pieces, respectively.

Turn over per year:

Perusal of data in Table 6 depicts the distribution of selected sample units by its yearly turnover. Majority of leather units (44.44%) had annual turnover of Rs. 3-5 crore followed by an equal percentage of leather units (33.33%) whose annual turnover lies between Rs. 1-3 crore and Rs. 500 to 1000 crore, respectively.

Total turnover per year (Crore)	Frequency(f)	Percentage (%)
1-3	3	33.33
3-5	4	44.44
500-1000	3	33.33

Type of workers vs nature of job:

Leather industry is highly labour intensive. The availability of plentiful supply of cheap labour is the important factor in the establishment of tannery industry in the study area. According to data in Table 7, in leather processing units there were 63.45 per cent workers who were employed on permanent basis, remaining 36.54 per cent workers were hired on contractual basis. In leather production units, 70.43 per cent workers works permanent and 29.56 per cent workers works on contractual basis. In leather processing and production units 67.16 per cent were permanent workers and remaining 32.83 per cent workers work on contractual basis.

Aspect/Variables	Permanent		Contractual		Total workers	
	f	%	f	%	f	%
Leather processing units (n=342)	217	63.45	125	36.54	342	100
Leather production (n=345)	243	70.43	102	29.56	345	100
Both leather processing and leather production (n=877)	589	67.16	288	32.83	877	100

Training of workers:

Table 8 revealed that majority of respondents

Aspects/Variables	Frequency (f)	Percentage (%)
Preferred skilled/trained workers		
Yes	6	66.66
No	3	33.34
Provide training to workers to develop skills		
Yes	2	22.22
No	7	77.78

(66.66%) preferred skilled workers in their units. When asked about need of providing training to these workers, majority (77.78%) of respondents stated that they did not provide any kind of training to these unskilled and semi-skilled workers.

Working hours/wages paid:

The working hours of all the leather units were observed as 8-9 hours /day. It was found that in some units, work was carried out in single shift whereas in others workers were employed in two shifts (before lunch (10 AM-2 PM) and after lunch (3 PM-5:30 PM).

Regarding wages paid, data revealed that wages were paid as per the government norms, and workers were employed/hired depending on the skill set as skilled, semi-skilled and unskilled workers. Skilled workers were paid Rs. 350-600/-day, semi-skilled workers Rs. 300-450/-day and unskilled workers Rs. 200-300/-day.

Sub units of leather processing/production units:

It was observed by the researcher at the time of data collection that both leather processing and leather production units have different subunits/departments to accomplish its work in different steps. Table 9 depicts

Aspects / variables	Sub units /department
Leather processing units	Preparatory
	Tanning
	Crusting
	Finishing/Surface coating
Leather production units	Designing department
	Cutting department
	Lasting department
	Closing department
	Sewing department
	Finishing department
	Quality check department
	Packaging department

the various sub units of leather processing/ and production units.

Leather processing technique:

Tanning is the main process carried out in leather processing unit by which raw animal hides are converted into leather. The process involves several stages, viz., The first stage is the preparation for tanning. The second stage is the actual tanning and other chemical treatment. The third stage, known as retanning, applies retanning agents and dyes to the material to provide the physical strength and properties desired depending on the end product. The fourth and final stage, known as finishing, is used to apply finish to the product (<http://italiaindia.com>). Before tanning, the skins are unhaired, degreased, desalted and soaked in water over a period of 6 hours to 2 days (<https://en.m.wikipedia.org>). The leather manufacturing process is divided into three sub-processes- preparatory stages, tanning and crusting. All true leathers will undergo these sub-processes. A further sub-process, surface coating may be added into the sequence. The list of operations that leathers undergo vary with the type of leather.

Preparatory stages:

The preparatory stages are when the hide/skin is prepared for tanning: (Sharphouse, 1983). During the preparatory stages many of the unwanted raw skin components are removed. Preparatory stages may include (Leaf,).

- Soaking : Water for purposes of washing or rehydration is reintroduced.
- Liming : Unwanted proteins and “opening up” is achieved.
- Unhairing : The majority of hair is removed.
- Fleshing : Subcutaneous material is removed.
- Splitting : The hide/skin is cut into two or more horizontal layers.
- Bating : Proteolytic proteins are introduced to the skin to remove further proteins and to assist with softening of the pelt (Heidemann, 1993).
- Degreasing: Natural fats/oils are stripped or as much as is possible from the hide/skin (Bienkiewicz, 1983).
- Frizing: Physical removal of the fat layer inside the skin (Sharphouse, 1983).
- Bleaching: Chemical modification of dark

pigments to yield a lighter coloured pelt.

Tanning:

Tanning is the process that converts the protein of the raw hide or skin into a stable material for a wide variety of end applications. The principal difference between raw hides and tanned hides is that raw hides dry out to form a hard-inflexible material that can putrefy when re-wetted (wetted back), while tanned material dries out to a flexible form that does not become putrid when wetted back. The most commonly used tanning material is chromium, which leaves the leather, once tanned, a pale blue colour (due to the chromium), this product is commonly called “wet blue”. The acidity of hides once they have finished pickling will typically be between pH of 2.8-3.2. At this point the hides are loaded in a drum and immersed in a float containing the tanning liquor. The hides are allowed to soak (while the drum slowly rotates about its axle) and the tanning liquor slowly penetrates through the full substance of the hide. Once an even degree of penetration is observed, the pH of the float is slowly raised in a process called basification. This basification process fixes the tanning material to the leather, and the more tanning material fixed, the higher the hydrothermal stability and increased shrinkage temperature resistance of the leather.

Crusting:

Crusting is when the hide/skin is thinned, retanned and lubricated. Often a colouring operation is included in the crusting sub-process. The chemicals added during crusting have to be fixed in place. The culmination of the crusting sub-process is the drying and softening operations. There are many operations in crusting.

Finishing:

After crusting process, surface coating is also applied to leather depending on end use, this is sometimes called as finishing. It also has several steps like brushing, padding, impregnation, buffing, spraying, roller coating, Polishing, plating, embossing, ironing, combing (hair-on), glazing, etc.

Procurement of raw materials:

Regarding procuring of raw materials, it was stated by the respondents that in leather processing units, raw hides of buffaloes and cows were procured from local

suppliers as well as from within state, other leather units procured raw materials in the form of imported wet blue.

Raw material used:

Researcher was found that cent per cent leather processing units were using raw hides/skins of animals as raw materials to produce semi-finished/finished leather after processing, similarly, all the leather production units were using imported wet blue, English leather and normal leather as per their production requirement for manufacturing of leather saddlery, harness, belts and footwear.

Products manufactured:

All the six leather units involved in leather product manufacturing were surveyed by researcher. The data from the Table 10 highlights that an equal number of leather production units (16.66%) were manufacturing only leather saddlery, harness goods and both Harness goods and belt, whereas remaining leather production units (50%) which were involved in both leather processing and leather production were solely producing footwear only.

Brand name of products developed:

It was observed by the researcher that only two leather production units making footwear, belts, etc. were selling their products in the brand name of Red Tape, while other units were not having any renowned brand for selling their produce.

Marketing of products:

Table 11 depicts the marketing of products by

selected leather processing/ and production units. It can be seen from the table that majority of the respondents (88.88%) were exporting their products to other countries, an equal percentage (66.66%) of respondents were selling their products in both local market and other states and 44.44 per cent respondents were selling with in the state.

Recycling and waste management:

It was found that all the three large scale leather processing and production units have their own Chromium effluent treatment plant (CETP) and remaining six leather units were connected to area chrome recycling plant. Further, it was revealed by the respondents of production units, that no air, water or soil pollution is caused by their units, only leather scraps obtained as a result of production process in the form of leather cuttings are sold to garbage collectors/nearby small scale units engaged in making of leather accessories like keyrings, wallets, belts, etc.

Medical facilities:

It was interesting to note that cent per cent units have proper medical facilities for their workers, they provide first aid kit and doctors on call in emergency to their workers. Further, it was found that three leather units which were interconnected have their hospital also which provides help for their workers as well as area citizens also.

Protective accessories to workers:

Perusal of Fig. 4 shows different protective accessories provided by the respondents for their workers to use at work place in selected leather processing/ and

Aspects/variables	Leather production units		Both leather processing and production units		Total	
	f	%	f	%	f	%
Leather saddlery	1	16.66	00	00	1	16.66
Harness goods	1	16.66	00	00	1	16.66
Harness goods and belt	1	16.66	00	00	1	16.66
Footwear	0	00	3	50	3	50

Marketing of products	Frequency(f)	Percentage (%)
Local market	6	66.66
With in state	4	44.44
Other state	6	66.66
Export to other countries	8	88.88

*multiple response

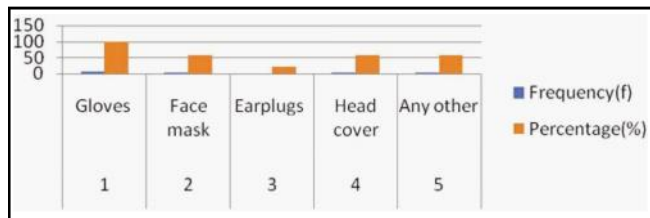


Fig. 4 : Percentage distribution of leather units by providing protective equipments

production units.

Cent per cent units provide gloves to their workers followed by face masks, head cover, apron etc. by half of the respondents.

Safety measures:

It was revealed by the respondents that as per government norms, all the industries are equipped with first aid kit, fire extinguishers, oxygen cylinders, etc. Some unit have their hospitals also to meet the medical requirement of their workers.

Conclusion:

Kanpur in the state of Uttar Pradesh, is world famous for its leather industries. It is a major production centre for saddlery goods in India, accounting for more than 95 per cent of the total exports of saddlery items. Kanpur, because of its specialization in tanning and finishing of buffalo hides, it is the only centre in the country which provides good quality leather in both semi-finished /finished form to leather production industries based on the end use requirement. Most of the leather production units have both domestic and international market and providing employment to millions of people. Kanpur leather traders export leather goods in large volumes throughout the world. Leather industry of

India has very good export potential.

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REFERENCES

- Bienkiewicz, K. (1983).** *Physical Chemistry of Leather Making*. Robert E. Krieger. p. 298. ISBN 0-89874-304-4.
- Heidemann, E. (1993).** *Fundamentals of Leather Manufacture*. Eduard Roether KG. p. 211. ISBN 3-7929-0206-0.
- Leafe, M.K.** "Leather Technologist's Pocket Book". Society of Leather Technologists and Chemists: 23.
- Schjolden, A. (2000).** Leather tanning in India: Environmental regulations and firms compliance, Working Papers, No. 21. ISSN 0804-5828 retrieved from http://s3.amazonaws.com/zanran_storage/www.cicero.uio.no/ContentPages/18864935.pdf on 14-12-2018
- Sharphouse, J.H. (1983).** *Leather Technician's Handbook*. Leather Producer's Association. p. 37. ISBN 0-9502285-1-6.

WEBLIOGRAPHY

- <http://www.indianmirror.com/indian-industries/leather.html>
- <http://www.indianet.nl/pdf/DoLeatherWorkersMatter.pdf>
- <http://www.indianmirror.com/indian-industries/leather.html>
- http://s3.amazonaws.com/zanran_storage/www.cicero.uio.no/ContentPages/18864935.pdf
- <http://italiaindia.com/images/uploads/pdf/leather-industry-in-india-2010.pdf>
- <http://italiaindia.com/images/uploads/pdf/leather-industry-in-india-2010.pdf>
- [https://en.m.wikipedia.org/wiki/Tanning_\(leather\)](https://en.m.wikipedia.org/wiki/Tanning_(leather))

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