

# Environmental Problems Caused By Leather Processing Units

By: Anshu Agarawal



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## **Abstract:**

The present study was undertaken to study the environmental problems caused by leather processing units Jaj-mau, Kanpur. A descriptive research design was planned using survey and questionnaire method. Random sampling technique was adopted to select a sample of 15 leather processing unit through lottery method.

The result highlighted that the detrimental work practices in leather processing units create not only environmental hazards but also occupational problems to worker. Use of different chemicals during leather processing produces wastes in solid, liquid and gaseous form. Exposure to different chemicals is the main cause of soil pollution, atmospheric pollution, water pollution and air pollution.

## **Introduction:**

Leather industry is one of the most polluting industries. The leather processing is responsible for unfavorable impact on environment. The global production of leather is about 24bn m<sup>2</sup> that presents a substantial challenge to leather industry. The tannery affluent produces high amount of dissolved and suspended organic and inorganic solids that are giving rise to high oxygen requirement. The unbearable smell generating from waste material and presence sulphide, ammonia and other volatile compounds are associated with leather processing activities.

Solid waste produced in leather industry include animal skin trims, animal hairs, flesh wastes, buffing dust and keratin wastes. All of these wastes contain protein as its main component. If this protein is not utilized properly, it will responsible for dangerous pollution problems to environment.

Nowadays tannery is a big industry. It is big employment source to the society. Kanpur is well known for its leather industry in the whole world but it is said that a coin has two faces; similarly Kanpur is also famous as the most polluted city of the world. Its generated waste is disposed in the Ganga River because most of the leather industries are situated in the bank of the Ganga River. This place is known as Jaj-mau. Jaj-mau is one of the most polluted areas in Kanpur.

In Jaj-mau when post treated sewage irrigation water is supplied to the farmland this leads to the sharp decline of food, crops, vegetables productivity. Besides contamination of underground water which is used for drinking purpose create serious health problems. This sewage water is also threatening the aquatic life.

## **Methodology:**

A descriptive research design was planned using survey method. To gain proper information about the functioning and existing status of leather processing units of Jaj-

mau, purposive random sampling method was adopted for investigation and to select respondents.

Of total leather processing units a sample size of 10% (15 units) were drawn to study the status and environmental hazards caused by leather processing units.

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

### **Result and 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, pollution treatment plants of the units, waste produced within the units during leather processing work and its disposal.

#### **Leather cluster:**

Jaj-mau is one of the major centers of leather processing in Kanpur. It is 8 km from east of Kanpur city and 20 km downstream from the IIT campus. Leather processing in jaj-mau is different from processing of other centers in Kanpur. Jaj-mau has its own specialty and people in profession have their own identity. The leather processors of Jaj-mau have restricted only to leather processing as they follow the old tradition of leather processing by some modifications and they want to continue it.

#### **Technical information of the units:**

The data regarding the type of unit revealed that 40% of the units are small scaled units followed by 26% of the units are medium scale followed by 34% units are large scaled units in Jaj-mau. The finding further indicated that the number of departments in 40% units is 3. Values of data regarding the existing number of departments have shown in a table given below:

<b>Sr. No.</b>	<b>No. of Department</b>	<b>Frequency (n)</b>	<b>Percentage (%)</b>
1.	4	6	40
2.	5	4	27
3.	6	5	33

The data given above shows that most of the units in Jaj-mau has minimum number of department because most of the units in Jaj-mau are small scale units. The 4 department within the units are soaking, liming, un-hairing, de-liming. The 5 departments within the units are batting, pickling, chrome-tanning, sammying, splitting. The six departments within the units are shaving, neutralizing, re-tanning dyeing, fat-liquoring and finishing. (*Leather making process from animal skin has given in last paper i.e. [occupational hazards caused by leather processing units](#)*).

#### **Distribution of the units regarding the type of animal skin used:**

<b>Sr. No.</b>	<b>Type of Animal Skin Used</b>	<b>Frequency</b>	<b>Percentage</b>
1.	Cow, goat, buffalo, horse	3	20
2.	Cow, buffalo	3	20
3.	Cow, goat	9	60

The data given above indicated that 20% of the units uses cow, goat, buffalo, horse skin as a raw material followed by 20% of the units which use cow and buffalo skin followed by 60% unit which use cow and goat skin. The reason for using cow and goat skin by most of the units is that the cow and goat skin are available at very low cost in comparison to buffalo and horse skin.

**Distribution of the unit according to the dye mostly used:**

Sr. No.	Dyes Used in Units	Frequency (n)	Percentage (%)
1.	Azo	6	40
2.	Reactive	4	27
3.	Disperse	2	13
4.	Direct	3	20

The data given above shows most of the units (40%) use azo dye to color leather followed by 27% of the units prefer reactive dyes followed by 13% of the units prefer disperse dye and remaining 20% units use direct dye to color leather.

**Distribution of the unit according to the pollution treatment plant:**

Sr. No.	Pollution Treatment Plant	Frequency (n)	Percentage (%)
1.	CET	6	40
2.	Storage tank	6	40
3.	Neutralization of unused gases	3	20

The data given above shows that 40% of the units have CET (Common Effluent Treatment Plant) similarly 40% of the units have storage tank and minimum number of the units i.e. 20% neutralize the unused gases.

This indicates that most of the units use CET and Storage tank for treatment of pollution.

**Distribution of the unit according to the waste produced:**

Sr. No.	Types of Waste Produced	Frequency (n)	Percentage (%)
1.	Solid	8	54
2.	Liquid	4	26
3.	Gaseous	3	20

The data given above indicates that most of the units (54%) produce waste in solid form followed by 26% of the units produce waste in liquid form and minimum numbers of the unit produce waste in gaseous form.

The solid waste is polythene, animal hair, skin trimming, fleshing, buffing dust, chrome shaving, hoofs, wrapper of chemicals etc. Liquid waste produced in leather processing units is basic chromium sulphate and other chemicals (name of chemicals is given in leather processing) which dissolve in water and produce liquid waste. Gaseous waste is fume and smell of different chemicals.

**Distribution of the units according to the form of disposal of wastes:**

Sr. No.	Form of Disposal of Wastes	Frequency (n)	Percentage (%)
1.	Solid	9	60
2.	Liquid	3	20
3.	Gas	3	20

The data given above indicates that most of the units (60%) dispose wastes in solid form followed by 20% of the units dispose wastes in liquid and gaseous form each.

**Types of pollution caused by leather processing units:**

- **Soil Pollution:** when the untreated waste water is disposed on the land, the soil of the land hold the polluted water. The soil gets contaminated and as a result it loses its productivity by declining crops.
- **Atmospheric Pollution:** Tanneries are well known for producing Malodor. Rehydration of salted hides and skins give out the odor of volatile fatty and amino acid. The circulation of malodorous substance in ambient air and its transportation to a distance is the main cause of atmospheric pollution.
- **Water Pollution:** The population and the quantity of waste are increasing in a large amount. The city which is situated in the bank of the river does not have any waste treatment facility. The disposal of waste into river can pollute the river water and produce various water borne diseases.  
According to the Health Statistics; around 11mn persons in India suffered from different water borne disease of which 11,234 people died. The disease includes typhoid, infective hepatitis, cholera, dysentery and gastroenteritis.
- **Air Pollution:** Carbon dioxide is one of the most important pollutants that cause air pollution. Human beings do exhale carbon dioxide. This gas has become very harmful when produced by industrial activity. Carbon dioxide is generally used in Leather Industry, Oil Industry, and Chemical Industry. The manufacturing process of leather, oil and chemical would require the use of carbon dioxide. Air pollution is also caused by the harmful gases released in atmosphere due to increasing number of power plant and leather manufacturing units.
- **Noise Pollution:** Industrial noise means the noise that is produced by machines within the factories and vehicles on the road. Sometimes it becomes intolerable. Any type of sound which is unwanted and intolerable is called noise pollution. This industrial noise not only affects the workers who are engaged in factory work but also residents residing in that place. The high volume gradually increases the adrenaline level and destructs the blood vessels. Noise pollution also responsible for clinical stress as well as psychological stress.

**Waste Produced in Leather Processing Units:**

- **Skin Collagen:** Animal skin composed of protein, carbohydrate, salt, mineral, water. There are several classes of protein present in animal i.e. elastin, collagen, keratin, albumin, globulin, glycoprotein. Among these several classes of protein

collagen is present in the largest amount. Only this collagen is responsible for making leather in combination with tanning agents.

- **Solid Wastes:** Out of 500 kg of raw hides approx 425 kg is generated as solid waste in leather processing and remaining 75 kg of raw material is got converted into leather. A large amount of solid wastes are produced by tannery i.e. wrapper of chemicals, animal hair, buffing waste, keratin, flesh and chrome shaving. Almost solid waste is produced during beam house operation. But if these solid wastes are hydrolyzed properly, it can be used as useful by-product.

### **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 units of Kanpur (jaj-mau) is one of the oldest leather units. With the passage of time different types chemicals are also used which trigger the process of making leather from animal skin but it pollute environment also. As a result various type water borne, air borne disease are taking place not only in industrial area but also in nearby residents.

### **Reference:**

- Shanmugam Kavita, "Polluting leather units face closure threat" Business Std. Apr, 2002
- Journal of scientific and industrial research vol-65
- Warriar Gopalkrishna S. "Tannery Effluent focus on reverse osmosis" Business line. Apr, 2002