Synergy: International Journal of Multidisciplinary Studies
Vol 1. **Issue** 1, 2024. pp. 30-35

Leather Waste Management and Possibilities of Employment Generation in India

Dharmveer singh[1*], Md Qaiser Alam[2], Pushpendra Singh[3]

Article History

Received: 19-04-2024
Acceptance: 22-05-2024
Published: 09-06-2024

Author

1. *Research Scholar, Dept. Of Economics, RBS College, Dr. Bhimrao Ambedkar University, Agra.
Email: veerdharm671@gmail.com
2. Associate Professor, Department of Economics, Aligarh Muslim University, Aligarh.
3. Professor, Department of Economics, RBS College Agra.

Abstract

India is not only famous for its historical monuments and its diverse culture but also for its traditional leather craft. The leather industry is one of the most polluting industries in India and the world as well because its production process includes the use of many chemicals and methods of processing that have a heavy impact on the environment. Having finished products, lefts lots of waste materials of leather, most of them come from organized and unorganized manufacturing units. One more interesting fact is that most people even don't know how to decompose them properly. They usually dump it openly or dispose of it on land sites. From all the stages of making finished leather out of 100% of raw material nearly 85% is generated as solid & liquid waste like (skins, fats, trimmings, process effluents, and sludge buffing dust,). Only 15% useable material is available for making leather products. Out of which nearly 50% is generated as waste during the cutting process even in the case of some goods it may be 60-70%. All these wastes can be used for making various useful items and industrial products. Proper utilization of these wastes will give a boost to the growth and development of the nation because there are great possibilities of utilizing these wastes for the betterment of society. The purpose of presenting this paper is to understand and find new innovative methods of using these wastes for generating employment opportunities, eliminating widespread poverty, and attaining various SDG goals of the UN.

Keywords: Leather Industry, Pollution, Solid & liquid waste, Employment, Innovation, Growth, and Development.

Introduction

Leather is renowned for its durability and wide range of products. In the Indian economy, the leather industry holds a significant position. It is recognized for its consistent high export earnings, making it one of the top 10 foreign exchange earners for the country. This industry heavily relies on the by-products of the meat and dairy industries, which contribute to over 95% of its raw materials. In the past, India primarily exported raw materials, but it has now transformed into a value-added sector, producing finished products. India's leather production accounts for approximately 12.9% of the global production of hides/skins, with an impressive annual production of about three billion square feet of leather. Moreover, India boasts 20% of the world's cattle and buffalo population, along with 11% of the goat and sheep population. It's worth noting that while animals are utilized for their skins and hides, they also serve important purposes in dairy and agriculture. The ethical implications of killing animals solely for their skin/hides should be considered. The industry is an employment-intensive sector that provides nearly 4.420 million jobs opportunities to the people. Most people, employed here, are from poor and weaker sections of society and below the age of 35 years.

In India, the leather industry is widely spread industry. The main problem of the industry is that it affects the environment very badly by extracting various types of pollutants and solid & liquid waste. In India, the most common way of managing this waste is dumping or disposing of this waste openly in the backyards or on land sites.

The purpose of this paper is to identify and investigate the uses of various kinds of waste materials in the leather industry to generate further employment opportunities and set up a proper waste management system in India.

Review of Literature

A.General

A careful review of the literature focuses on the past work those were conducted to determine the characteristics of leather waste, its management, its disposing methods without affecting the environment, and its use for producing useful products that generate employment opportunities for people. This will help to curb the problem of rising pollution, environmental degradation, unemployment, and the backwardness of the economy.

B. Literature Review

V. Anuradha's 1999 study explored the potential for repurposing tannery hide flesh as feed for fish and poultry. Similarly, Venkatachalam A. and colleagues (2015) examined the creation of high-performance bituminous mixtures utilizing tannery waste. In India, industrial and domestic activities generate over 960 million tons of solid waste annually, with improper disposal of unused lands posing severe environmental threats. Effective recycling of this waste is essential for energy conservation and resource preservation.

L.S. Simeonova et al. (1996) researched the utilization of leather industry waste, proposing a conversion method to transform waste into valuable products. Their study indicates that developing this method into a technology could address economic and environmental challenges. They found that from every 30 tons of waste, approximately 1-2 tons of edible gelatin, tallow, and protein concentrate could be produced. This method not only mitigates waste management issues but also creates commercially viable products.

C. Observations from Literature

After having a detailed study of the above literature, it can be concluded that the problem of leather waste management has been studied for a long time and most studies are focused on decomposing and disposing of solid and liquid waste by using various methods and techniques. There has been very little or rare focus on the utilization of leather wastes (left during and after the cutting process) for making handicraft items or useful small products that can be better options for cutting waste material for engaging people in employable activities primarily women in weaker sections of society.

Need for the Study

In India, the leather industry is widely spread industry. Most major production centers are situated in the following state of south and north India as follows:

Table 1

State of active leather industries in India

1.	Tamil Nadu	2.	Kerala	3.	Karnataka
4.	Delhi	5.	Rajasthan	6.	Madhya Pradesh
7.	Andhra Pradesh	8.	Uttar Pradesh	9.	J & K
10.	Maharashtra	11.	Punjab	12.	West Bengal
13.	Haryana				

Table 1 listed above, indicates that the industry is big and it has great potential to generate employment

opportunities for mass. Along with these opportunities, a great challenge is to manage the bulk wastage by the industry. The industry produces various types of waste materials which are as follows:

Table 2

Wastes obtain from the leather industry during processing

Fleshing	50-60%
Chrome shaving, chrome splits, and buffing dust	35-40%
Skin trimmings	5-7%
Hair	5-7%

Source: Venkatachalam v. al (2015)

The wastes generated in all the processes can be used for making useful products and the leather left in the cutting process can be converted into useful handicrafts that will ultimately generate employment in an economy.

Limitations

The complete picture of the whole system is not possible to present because various small-scale and micro units of leather products are run by individuals who are not listed under any supervisory authority. So it is difficult to identify the waste generated by these entities or unable to trace the methods of waste management and even there is no standard wages system for their employees.

Hypothesis

Null Hypothesis (Ho):

Waste management measures, taken in India, are enough to protect the environment and sustainable development of the economy which generate further employment opportunities for people.

Alternative Hypothesis (H1):

Waste management measures, taken in India, are not enough to protect the environment and sustainable development of the economy which generate further employment opportunities for people.

Methodology

The methodology is formulated based on the review of literature, using a research library with online access to books, research papers, articles, Government reports, journals, newspapers, and encyclopedias. The data is collected from secondary sources.

Objectives

1. To identify and investigate the way of managing wastage of the leather industry in a sustainable manner.
2. To find new possibilities for employment generation by using these wastages.
3. To anticipate the challenges of leather waste management and find new employment opportunities in India by using these wastages.
4. Analyzing the role of government in controlling, guiding, promoting, and supporting the industry by its various schemes and policies.

About the industry

1. The leather industry has a total worth of $18 billion during the period of 2016-17, as reported by the Council of leather exports.
2. In 2018-19, the industry's total exports reached $5.65 billion.

3. The domestic turnover of the industry amounts to $12 billion.
4. The industry is known for providing employment opportunities to a significant number of people, with 4.42 million individuals being employed, predominantly from the weaker sections of society. Approximately 30% of these employees are women.
5. India holds the position of the second-largest footwear producer globally, manufacturing around 2.41 billion pairs in 2017. Additionally, India is the second-largest exporter of leather garments and the third-largest exporter of saddlery & harnesses worldwide.
6. There are a total of 2091 tanneries in the country, out of which 1803 units are in small-scale sector[1].

*[1]**Source**: Dilex india.com

Methods of Processing of Leather Waste

1. Thermal methods: which involve the application of heat to induce physical changes.
2. Chemical techniques: That refers to the use of various reagents in solutions to extract substances.
3. Hydrolytic processes: It involve the treatment of substances with enzymes to break them down.

Problems created by leather wastage

1. Disposing of waste has been a headache for industries and individual firms for a long time. Some of them even don't have proper waste management systems or techniques so they directly burn leather pieces openly in their backyards because these have already been chemically treated when these pieces go up in flames, all the chemicals and toxic material evaporate and cause a lot of pollution. This harms not only the environment but also the people who work there. This turn affects companies in less production due to sick employees.
2. This industry releases keratin-containing wastes like hairs and wool. The most common method adopted by tanneries to handle this waste is to burn the waste openly which produces a high number of COD, BOD, TDS, etc.
3. The leather industry produces chromium-containing solid waste. This alters the normal physiochemical properties of soil and water. This is highly dangerous to humans, animals, and the overall environment. Some biodegradable wastes are generated by the industry.

Suggested use of leather waste

First of all, we have to understand how the industry work and what amount and type of waste is being generated by it. Less than 2% of animals in the world are farmed specifically for their skin to produce luxury goods. Out of the total input received for production only 40% is useable other becomes waste in the form of various types of waste. Here one thing is very interesting that more than 50% of material that can generate profit and provide employment opportunities for people is not considered this reduces the added value of the overall process. Here are some methods and processes that can be used or are already in use in the world for using this waste for generating some valuable output.

1. A project "structural skin" is suggested by Jorge Penadés. He is a Spanish artist who makes use of this leather waste to make wood-like material by combining it with resin, putting this substance in a mold, and compressing it into a strong, solid material this can be used to make furniture, new mirror stand, tube light stand, and various objects of decoration.
2. A project "precious skin" by Victorial-ledig. According to her, she uses those parts of the patch which are not even considered actual leather like a cow's head, tail, or lower leg, and turned them into leather and highlights their natural form and texture. She turns her tail into a handle, an ear into a purse, etc.
3. The leather industry produces chromium-containing solid waste (wet blue leather). The use of this waste as fertilizer may be an interesting alternative to their disposal. According to the Brazilian Environmental Council, this is type one waste. This solid waste of leather can be used as a Nitrogen source for the growth of common bean plants.

4. Collagen hydrogels: They can be used for improving the natural water holding, increasing productivity by reducing water consumption, and preventing unnecessary fertilizer consumption in agriculture. The Collagen obtained from the leather process wastes with chemical modification.
5. Activated carbon can be prepared from leather waste. This is a new material that contains small particles of chromium oxide that can be used for polishing or stropping.
6. As we know that leather wastes are highly pertinacious so a wide range of value-added products can be produced and this will create new opportunities like biogas and bio-fertilizer from non-tanned waste that can be one of them.
7. Leather waste can be used to make covers for industrial equipment and utility tools like knife, hammer, saw, etc.
8. Hair and wool generated during the process of production can be used in the textile industry to make various items like mats, carpets, saddle cloths, blankets, etc.

Recent actions, schemes, major initiatives, and assistance programmes of GOI

1. Recently, the National Green Tribunal criticized the Uttar Pradesh government for its failure to prevent the discharge of sewerage containing toxic chromium into the Ganges at Rania and Rakhi Mandi in Kanpur. Consequently, a penalty of Rs 280 crore has been imposed on 22 tanneries for their role in causing pollution.
2. The India Leather Development Programme (ILDP) was established to enhance productivity, optimize capacity, reduce costs, and foster design and development within the leather sector. It also aims to encourage entrepreneurship by supporting the establishment of new units. All existing units are eligible for ILDP benefits, which include cash profits for two years. A key activity under ILDP has been the provision of placement-linked skill development training for unemployed youth in the leather and footwear industries. This program concluded on March 31, 2017, and was succeeded by the Indian Footwear, Leather & Accessories Development Program (IFLADP).
3. The IFLADP was initiated to boost manufacturing and generate employment in the sector. The Government of India approved a special package of Rs 2,600 crore for the period 2017-2020. This scheme offers financial support covering 70% of project costs for leather clusters to meet prescribed pollution control discharge norms. It encompasses the establishment, expansion, and upgrading of Common Effluent Treatment Plants (CETPs), development of secure landfills, creation of common recovery units, management of sludge, and other hazardous waste management techniques. Currently, nine CETP upgrade projects with a total value of INR 469.18 crore, including GOI assistance of INR 328.43 crore, have been approved under this scheme. The industry has the potential to create 250 jobs for every $0.2 million invested.

Shri Mukhtarul Amin, Chairman of the Council for Leather Exports (CLE), underscored the critical importance of implementing the Indian Footwear, Leather & Accessories Development Program (IFLADP). He emphasized that the program is essential for expanding and modernizing production capacities within the sector, enhancing environmental management practices in the tanning industry, creating new large-scale clusters, and developing human resources. Moreover, he projected that the package would generate approximately 300,000 new jobs over the next three years.

Shri P. R. Aqeel Ahmed, Vice Chairman of CLE, expressed satisfaction with the enhanced funding support for upgrading and establishing Common Effluent Treatment Plants (CETPs) in the tannery sector. He highlighted that the government's decision to increase its funding contribution from 50% to 70% of the project cost provides significant relief to the tanning industry. He thanked the Government of India for approving this increase, noting that it will benefit all CETPs nationwide. Currently, tanneries operate at only 40% to 50% of their installed capacities due to effluent discharge limitations imposed by CETPs. By increasing the effluent processing capacities of CETPs, the tanning sector will be able to utilize a higher percentage of its installed capacity.

Conclusion

There is still a lot of innovations to be made within the leather industry because there is relatively a very high amount of waste is generated every day so it has to be used in some new products which will help in protecting the environment, providing employment, earning profit and saving unnecessary death of innocent animals for their skin and flesh. If this wastage is used for the production of useable items this will help in controlling pollution and generating new possibilities of employment. In India government has launched various schemes and initiatives to support the industry which will help the industry to grow sustainably.

References

1. Council for Leather Exports, Government of India. (2017). Press release – IFLADP - 2017-20.
2. Department of Industrial Policy and Promotion, Department of Commerce. (2016). *Achievement report of leather sector*, Dec. 21, 2016 (updated on March 31, 2017).
3. Exim Bank. (2015). Indian leather industry: Perspective and strategies (Working paper series, Paper No. 46, pp. 13-83).
4. Galperina, M. (2014, May 8). *Scrap leather bags from heads, snouts and ears*. Animal New York. Retrieved November 22, 2019, from www.animalnewyork.com/2014/scrap-leather-bags-pig-heads-snouts-ears
5. Kaziceme. (2019). *Agriculture products*. Retrieved November 20, 2019, from www.kaziceme-arge.com/areas-of-research
6. Lima, D. Q., Oliveira, L. C. A., Bastos, A. R. R., et al. (2010). Leather industry solid waste as nitrogen source for growth of common bean plants. *Applied and Environmental Soil Science,* 2010, Article ID 703842. https://doi.org/10.1155/2010/703842
7. Nigam, H., Das, M., Chauhan, S., et al. (2015). Effect of chromium generated by the solid waste of tannery and microbial degradation of chromium to reduce its toxicity: *A review. Advance in Applied Science Research*, 6(3), 129-136.
8. Oliveira, L. C. A., Guerreiro, M. C., Goncalves, M., et al. (2008). Preparation of activated carbon from leather waste: A new material containing a small particle of chromium oxide. *Materials Letters*, 62(21-22), 3710-3712. https://doi.org/10.1016/j.matlet.2008.05.023
9. Purkait, M., Mondal, P., & Chang, C.-T. (2019). Treatment of leather plant effluents. In M. Purkait, P. Mondal, & C.-T. Chang (Eds.), *Treatment of Industrial Effluents* (pp. 1-26). CRC Press. https://doi.org/10.1201/9780429401763-3
10. Rs 280 cr fine on tanneries for dumping Chromium. (2019, November 19). *The Times of India*, p. 4.
11. Sankar, U. (2019). Common effluent treatment plants: An institutional arrangement for pollution control in small scale tanneries in India.
12. Simeonova, L., & Dalev, P. G. (1996). Utilization of a leather industry waste. *Waste Management*, 16(8), 765-769. https://doi.org/10.1016/S0956-053X(97)00020-2
13. Structural skin. (2019). *Structural skin furniture, lighting, mirror, object*. Retrieved November 22, 2019, from www.oficinapenades.com/project/structural-skin-furniture-lighting-mirror-object
14. Valeika, V., Jankauskaite, V., Beleska, K., et al. (2018). Biodegradability of hair as a waste of leather industry. *7th International Conference on Advanced Materials and Systems*. https://doi.org/10.24264/icams-2018.VIII.15
15. Yılmaz, O., Kantarli, I., Yuksel, M., Saglam, M., & Yanik, J. (2007). Conversion of leather wastes to useful products. *Resources, Conservation, and Recycling*, 49(4), 436-448. https://doi.org/10.1016/j.resconrec.2006.05.006