

Training Module on
Leather Products



नमामि
गंगे



भारतीय वन्यजीव संस्थान
Wildlife Institute of India





*Jalaj: Supporting
conservation and livelihood
through sustainable
resource use*



JALAJ-WII, NMCG INITIATIVE

The Ministry of Jal Shakti, Government of India through the National Mission for Clean Ganga (NMCG) entrusted the Wildlife Institute of India, (WII) a project entitled “Biodiversity Conservation and Ganga Rejuvenation” for developing a science-based aquatic species restoration plan for Ganga River by involving multiple stakeholders. This project successfully integrates livelihood and skill enhancement activities in alignment with Ganga conservation, employing both traditional livelihood centers and the innovative mobile livelihood unit known as "Jalaj." This pioneering business model has garnered recognition and adoption by district and state administrations across the Ganga river states. The core objective of the initiative is to interconnect local livelihoods with the conservation initiative, achieved through comprehensive training and the establishment of livelihood centers. These endeavors have been identified as a potential model for the broader "Arth Ganga" program. Consequently, this endeavor actualizes the Arth Ganga vision within the Ganga River basin by fostering a mutually beneficial relationship between the river and its communities, epitomized by the innovative "Jalaj" approach.

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PREFACE

The Ganga River, considered the lifeline of millions, faces unprecedented challenges due to pollution, industrial waste, and unsustainable practices. Recognizing the critical need for proactive measures, Ganga Prahari has embarked on a mission to blend tradition with technology, introducing a range of leather products that not only exemplify exquisite craftsmanship but also contribute to the safeguarding the purity of the Ganga River. This module is a testament to the vision of Ganga Prahari, a vision that harmonizes economic activities with ecological responsibility. By incorporating sustainable and eco-friendly practices into the production of leather goods, we aim to minimize the environmental footprint associated with traditional manufacturing processes.

The leather products featured in this module are not just commodities; they are ambassadors of change. As we unveil this leather product module, we invite individuals, communities, and businesses to join hands with Ganga Prahari in our collective responsibility to preserve the Ganga River for future generations. Together, let us forge a sustainable path towards a cleaner, healthier Ganga ecosystem.

MODULE OVERVIEW

This training module on leather products provides a comprehensive understanding of the leather based products, including the types of leather, production processes, quality assessment, and sustainable practices. Whether you're a newcomer or seeking to enhance your knowledge in this sector, this module covers key aspects of leather products.



MODULE OBJECTIVES

- To understand the basics of leather and its various types.
- To explore the leather production process, from raw materials to finished products.
- To learn how to assess leather quality.
- To gain insights into sustainable practices in the leather industry.
- To comprehend the market trends and challenges in the leather product industry.

MODULE 1: INTRODUCTION TO LEATHER

What is leather?

Leather is a durable and flexible material made by tanning process. It can be produced through manufacturing processes ranging from cottage industry to heavy industry. The material is suitable for applications such as clothing, accessories and upholstery. It is valued for its strength, versatility and natural aesthetic appeal.

Types of leather:

There are many kind of leather used in different industries but mainly three types of leather used prominently are full-grain, top-grain and genuine leather. Other types of leather includes chrome leather, suitcase leather, embossed leather, betting leather used in leather industry goods.

History of leather:

Earlier during prehistoric period, humans used animal hides for clothing and shelter, later, after discovering that tanning - a process to make hides more durable that could enhance the material's properties the Egyptians, Greeks, and Romans valued leather for clothing, armor, and accessories. The Greeks developed more sophisticated tanning methods as well. Leather became central to daily life in medieval Europe. Tanneries proliferated, and leather goods ranged from shoes and belts to saddles and armor. Leather also played a vital role in early American settlements, used for footwear, clothing, and tools. The 19th century witnessed innovations in leather production with the Industrial Revolution. Mass production and mechanization improved efficiency. Leather maintained its importance during wartime for military gear. Bomber jackets, boots, and other leather items were standard issue for soldiers. The post-war era saw the rise of fashion and a surge in leather's popularity. Leather jackets, especially associated with rebellious youth culture, became iconic. Environmental concerns led to innovations in tanning processes. Synthetic alternatives emerged, but genuine leather maintained its allure for quality and durability. Leather remains a versatile material in fashion, accessories, upholstery, and more.

Throughout history, leather has been an integral part of human civilization, adapting to cultural, economic, and technological shifts. Its enduring appeal lies in its combination of functionality, durability, and aesthetic appeal.

MODULE 2: LEATHER PRODUCTION PROCESS

Raw materials: Animal hides and skins.

Source: Predominantly, most of the manufacturing units for leather goods are located in cities like Kolkata, Chennai, Mumbai, Kanpur, Bangalore and Pondicherry. Kanpur is popularly known as the “Leather city of the world”.

Types of Leather:

Understanding the type of leather is crucial when choosing products or materials for specific purposes, as each type has its own set of qualities, characteristics and uses. Some common types are:

- **Full-grain leather:** Made from the top layer of the hide, it retains the natural grain and markings. It's durable and develops a patina over time. It refers to the leather which has not had the upper “top grain” and “split” layers separated.



Figure 1: Full Grain Leather

- **Top-grain leather:** Similar to full grain but with a layer sanded off to remove imperfections. It is often more uniform in appearance. It is the second highest quality and has the “split” layer separated away, making it thinner and more pliable than full grain.



Figure 2: Top Grain Leather

- **Corrected-grain leather:** It is this leather had an artificial grain applied to its surface.



Figure 3: Corrected Grain Leather

- **Split leather:** It is leather created from the fibrous part of the hide left once the top-grain of the rawhide has been separated from the hide.



Figure 4: Split Leather

- **Genuine Leather (Suede):** This term can be misleading. It refers to real leather but doesn't specify the quality. It's often a lower-grade product. Made from the inner side of the hide, it's softer and more pliable than full grain leather, with a napped finish.



Figure 5: Genuine Leather

- **Nubuck Leather:** Full grain leather buffed or sanded to give a suede-like appearance and feel.



Figure 6: Nubuck Leather

- **Bonded Leather:** Composed of scraps of leather bonded together with an adhesive. It's less durable than top or full-grain leather.

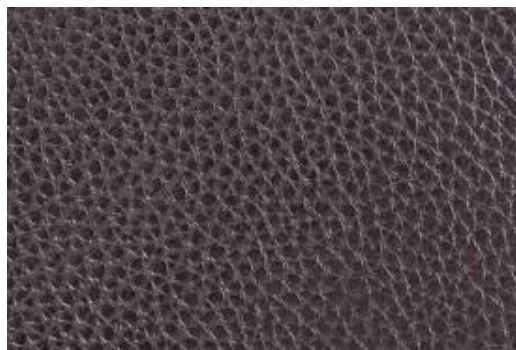


Figure 7: Bonded Leather

- **Exotic Leather:** Includes leather from non-traditional sources, such as snakes, alligators, or ostriches, known for their unique textures.



Figure 8: Exotic Leather

- **Vegetable-Tanned Leather:** Tanned using plant extracts, resulting in a natural and environmentally friendly product. The vegetable-tanned leather is tanned using tannins and other ingredients found in different vegetable matter, such as tree bark prepared in bark mills, wood, leaves, fruits and roots and other similar sources. It is supple and brown in color, with the exact shade depending on the mix of chemicals and the color of the skin. It is the only form of leather suitable for use in leather carving or stamping.



Figure 9: Vegetable-Tanned Leather

- **Chrome-Tanned Leather:** Tanned using chromium salts, creating softer and more pliable leather suitable for a variety of products. The chrome-tanned leather is tanned using chromium sulphate and other salts of chromium. It is more flexible and pliable than vegetable-tanned leather and does not discolor or lose shape as drastically in water as vegetable-tanned.



Figure 10: Chrome-tanned Leather

- **Patent Leather:** Coated with a high-gloss finish, often used for formal shoes or accessories.



Figure 11: Patent Leather

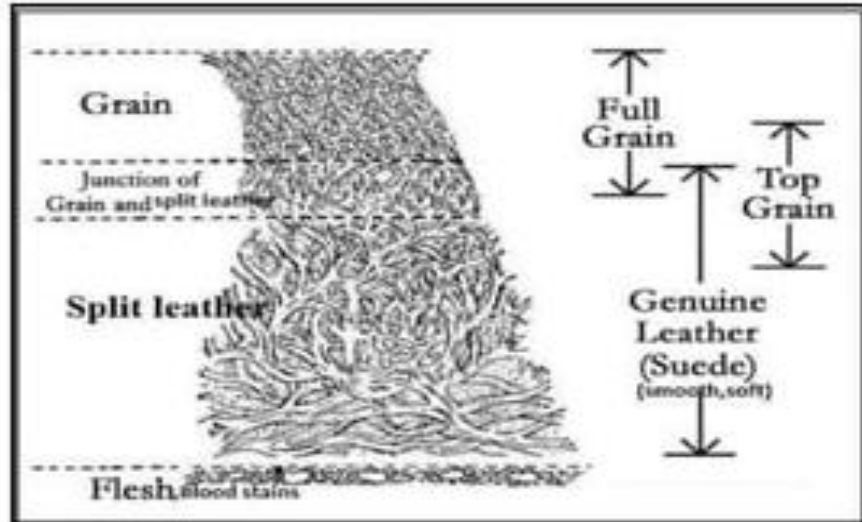


Figure 12: Types of Leather

Tools: They will be able to identify and use different electrical equipment and perform various process such as hydraulic cutting and clicking, straps cutting, splitting, embossing, cementing, zigzag sewing and flat bed, post bed stitching.

MODULE 3: LEATHER PRODUCT MANUFACTURING PROCESS

1. **Preparatory stage:** The raw hides/skin is cleaned and sterilized and includes stages such as soaking, unhairing, splitting, degreasing, bleaching and saline treatment.
2. **Tanning methods:** Tanning is the process that converts the raw hides into more stable form. In this process the proteins and fibers of the raw hides is reacted with certain chemicals (Ex. Chromium, Formic acid) which changes the property of the materials and makes it more stable for the longer usability
3. **Crusting:** Crusting is the process by which the hide/skin is thinned, retanned, lubricated, soften and simultaneously coloured by the use of chemical.

The precautions which are to be taken by crusting are as below:

- Amount of chemical used.
- Temperature & Pressure.
- pH i.e., Maintain between 4.5 to 6.5.
- Drying: The leather is dried to various moisture levels.
- Removal of moisture i.e., 40% to 55% water is squeezed out of leather.

Leather finishing: Leather finishing is a crucial process in the production of high-quality leather goods. This final step involves enhancing the surface appearance and feel of the leather, ensuring durability and visual appeal. Various techniques, such as dyeing, polishing, and coating, are employed to achieve desired textures and colors. Finishing not only improves the leather's resistance to wear and tear but also adds unique characteristics, making each piece distinct. Whether creating luxurious bags, shoes, or furniture, skilled artisans meticulously apply finishing touches to elevate the overall quality and artistic of leather products.

Leather cutting and Stitching: Leather stitching is a meticulous craft that binds pieces of leather to create durable and visually appealing products. Skilled artisans use specialized needles and threads, carefully weaving intricate patterns. The stitching not only reinforces structural integrity but also contributes to the visual charm, showcasing precision and expertise in the art of leatherwork.

Pattern Making: prepares patterns and full-size canvas models of garments and other articles of fur to guide cutters and finishers. Draws pattern on paper in accordance with garment design or customer's measurements. Makes canvas model of garment according to pattern. Checks patterns and model for accuracy and makes necessary alterations. Passes them to garment cutters or finishers. Examines completed garment for defects. Cuts patterns for fur trimmings, accessories and other fur articles and for alteration of fur articles. May cut patterns for fancy leather goods.

Supervisor and Foreman, Leather Goods Making; supervises manufacture of fancy and other leather goods such as wallets, portfolio case, mobile case, ladies handbag according to customer's choice or latest designs. Studies designs from catalogue or samples and decides manufacturing process. Arranges for required type and quality of materials and gets working pattern made to suit specifications. Instructs and guides workers as required and ensures correct operations and quality and finish of ultimate product. May specialize in manufacture of any particular items and be designated accordingly.

MODULE 4: QUALITY ASSESSMENT

Understanding leather grades: Leather grades categorize the quality of hides based on factors like texture, blemishes, and thickness. Full-grain leather, the highest grade, retains the natural grain and imperfections, ensuring durability. Top-grain leather is sanded to remove imperfections, while genuine leather is more processed. Understanding these grades aids in choosing leather suitable for specific applications.

How to assess leather quality: Assessing leather quality involves examining texture, grain, and finish. High-quality leather feels supple, with a smooth, consistent grain pattern. Full-grain leather, with natural markings, signifies premium quality. Check for even coloration and a pleasant aroma. Additionally, flexibility and resistance to scratches are indicators of well-tanned, superior leather. The smell of the leather also indicates the durability of the leather goods.

Common leather defects and their causes: Common leather defects can include scars, scratches, wrinkles, and discolorations. Scars result from healed wounds on the animal's skin, while scratches may occur during processing. Wrinkles can be caused by improper storage or drying, and discolorations may stem from uneven dyeing. Understanding these defects helps in selecting and caring for leather products.

Recognizing Genuine vs. Synthetic leather: Distinguishing genuine leather from synthetic alternatives involves a few key factors. Genuine leather has a distinct natural grain and unique imperfections, while synthetics often exhibit a consistent, artificial pattern. Touch can reveal genuine leather's warmth and suppleness, whereas synthetic feels cooler and more uniform. Smell is another clue; genuine leather carries a characteristic, pleasant aroma, unlike the chemical odor of synthetic materials. These considerations aid in making informed choices when purchasing leather products.

MODULE 5: SUSTAINABILITY IN THE LEATHER INDUSTRY

Environmental impact of leather production:

The leather adversely impact the environment in addition with the production process that causes high environmental impacts, most notably due to the heavy use of chemicals in the tanning process and causes air pollution due to the transformation process.

Sustainable practices: Prefer eco-friendly tanning process, waste reduction, and recycling of leather material.

Certification and ethical considerations in leather production:

- **ILDP** (Indian Leather Development Program) - The Euro 223.15 Million Scheme was undertaken during the Ninth five year plan (1996-2000) and is still being implemented during the eleventh five year plan (2007-2012).
- **Tannery Modernization Scheme-** This was launched under ILDP in 2000. The objective was to support existing tanneries for undertaking modernization program for positive environmental impacts, becoming competitive, affecting better capacity utilization, achieving productivity gains and reducing wastage.
- **NLDP (National Leather Development Program)-** The joint Program of Government of India and UNDP with a total outlay of Euro 19.11 Million was drawn up for the integrated development of leather and leather products sector within the country.
- **Leather Technology Mission-** The Government of India launched the four year mission in January 1995 aimed at spreading the awareness of the wide variety of technology in the leather sectors primarily focusing the tanneries. The program coordinated by the Council of Scientific and Industrial Research with its constituent organization, Central Leather Research Institute covered 172 project in 16 States.

MODULE 6: LEATHER PRODUCTS

Process of making Leather Products:

A leather bag is taken here as an example, similar steps can be taken for crafting other leather based goods. The process involves several steps, and the complexity may vary based on the design and style. Here is an overview:

- **Design and Pattern:** Plan the bag's design and create a pattern, considering dimensions and features.
- **Material Selection:** Choose high-quality leather appropriate for the project, considering thickness and texture. Material such as Goat leather/finished leather can be used.
- **Cutting:** Use the pattern to cut leather pieces precisely. Pay attention to grain direction for a consistent appearance.
- **Marking and Stitching Holes:** Mark stitching lines and punch holes for stitching. This ensures even seams.
- **Dyeing/Coloring:** Apply dye or color to achieve the desired finish. The block machine with desirable design can be used. Allow time for drying.
- **Assembling:** Stitch or glue pieces together according to the pattern.
- **Hardware Attachment:** Add any necessary hardware, such as buckles, zippers, or clasps.
- **Edge Finishing:** Smooth and finish the edges for a polished look.
- **Strap Attachment:** If applicable, attach handles or straps securely.
- **Final Finishing:** Condition the leather, polish, and buff to enhance the appearance.
- **Quality Check:** Inspect the bag for any flaws or inconsistencies.
- **Packaging:** Once satisfied with the quality, prepare the bag for use or sale.

Throughout the process, attention to detail and craftsmanship is essential to ensure the final product meets both functional and aesthetic standards.

MODULE 7: APPLICATIONS OF LEATHER SINCE HISTORICAL ERA

- **Clothing and Protection:** Early humans used animal hides to craft clothing, providing protection against the elements. Leather's durability and flexibility made it an essential material for garments and armor.
- **Footwear:** Leather shoes date back to ancient civilizations like the Egyptians and Romans. The material's resilience and comfort made it ideal for footwear, symbolizing status and protection.
- **Art and Craftsmanship:** Many ancient cultures employed leather in artistic expressions. From intricate carvings to embossing, leather became a medium for craftsmanship, showcasing cultural motifs and stories.
- **Military Usage:** Throughout history, leather has been crucial for military gear, including armor, boots, and other protective equipment. Its strength and resilience made it indispensable in warfare.
- **Book binding:** Leather has been historically used for book covers, adding a touch of elegance and protection to manuscripts. This tradition persists in some high-end bookbinding practices today.
- **Trade and Commerce:** The leather industry has been a cornerstone of trade and commerce in various societies. The demand for leather goods led to the establishment of tanneries and trade routes.
- **Symbol of Status:** In many cultures, possessing leather goods symbolized wealth and status. From luxurious leather garments to accessories, it became associated with affluence.
- **Rituals and Symbolism:** Leather has been used in rituals and ceremonies across cultures. It often symbolizes strength, durability, and protection, contributing to the material's cultural significance.
- **Transportation:** The use of leather in harnesses, saddles, and later in automobile interiors contributed significantly to the development of transportation systems.
- **Traditional Crafts:** Many traditional crafts, such as leatherworking and tanning, have been passed down through generations, preserving historical techniques and skills.

MODULE 8: PRODUCTS MADE UP OF LEATHER

Popular leather products: Shoes, bags, wallets, portfolio case, pet accessories, mobile case, ladies handbag, watch bands, footwear, camera and guitar straps, gloves, suitcases, purses, belts, whips.



Figure 13: Leather Purse made by Ganga Praharis

Table 1: Different Leather Products:

Products	Description
Handbags	Handbags with or without shoulder strap
Pocket or small leather goods	Wallet, purses, key pouches, credit card cases, pen cases
Travel goods	Suitcases, casual travel bags, beauty cases, sports bags and other travel articles
Stationary Articals and specials	Writing pads, book covers and camera
Cases	Spectacles cases, Jewellery cases, mobile phone holder
Belts	Men and women belts
Sports articles	Balls for football
Watch straps	Straps of wrist watches for men and women

MODULE 9: CHALLENGES AND FUTURE TRENDS

Challenges faced by the leather industry:

The leather industry faces various challenges that impact its sustainability and growth. Environmental concerns arise from the industry's reliance on chemicals in tanning processes, contributing to pollution. Ethical issues, including animal welfare concerns and labor practices, pose challenges. Fluctuating raw material costs and market demand volatility affect profitability. Additionally, competition from synthetic alternatives and changing consumer preferences for sustainable and cruelty-free products necessitate innovation within the industry to address these challenges and foster a more environmentally and socially responsible approach.

Emerging trends:

The leather industry is evolving with a focus on sustainability, eco-friendly tanning processes, and vegan leather innovations. Technology integration, artisanal craftsmanship, and circular economy practices are shaping a dynamic landscape, responding to conscientious consumer demands.

Conclusion:

The training module offers a comprehensive overview of leather products, from their production processes and quality assessment to sustainable practices and market trends. By completing this module, participants will acquire the knowledge and tools to excel in the leather industry and make informed decisions about leather products.

Precautions:

- Always, first learn about safety and environment, use of fire extinguishers, artificial respiratory resuscitation while working with leather goods.
- Always keep in mind regarding the wastages, its proportions and limits of leather. Waste cutting and their utilization should be focused.
- Different types of treatment for storage, preservation and storing of raw materials should be known.

LINKING LIVELIHOOD AND CONSERVATION

Linking livelihoods with the conservation is paramount for the sustainable future of both people and the environment. The Ganga sustains millions of livelihoods through different sectors such as agriculture, fishing, tourism. However, these activities often harm the river and its diverse ecosystems. To ensure the health of the Ganga River and its biodiversity, it is essential to promote eco-friendly livelihoods. Initiatives like Jalaj that implements practices like organic farming, sustainable fishing practices, and responsible tourism can provide economic opportunities while safeguarding the river. Additionally, raising awareness and involving local communities in conservation efforts can create a sense of ownership, fostering a collective commitment to conserve the rich biodiversity of the Ganga River, ensuring a harmonious coexistence between humans and nature.



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