

JILTA



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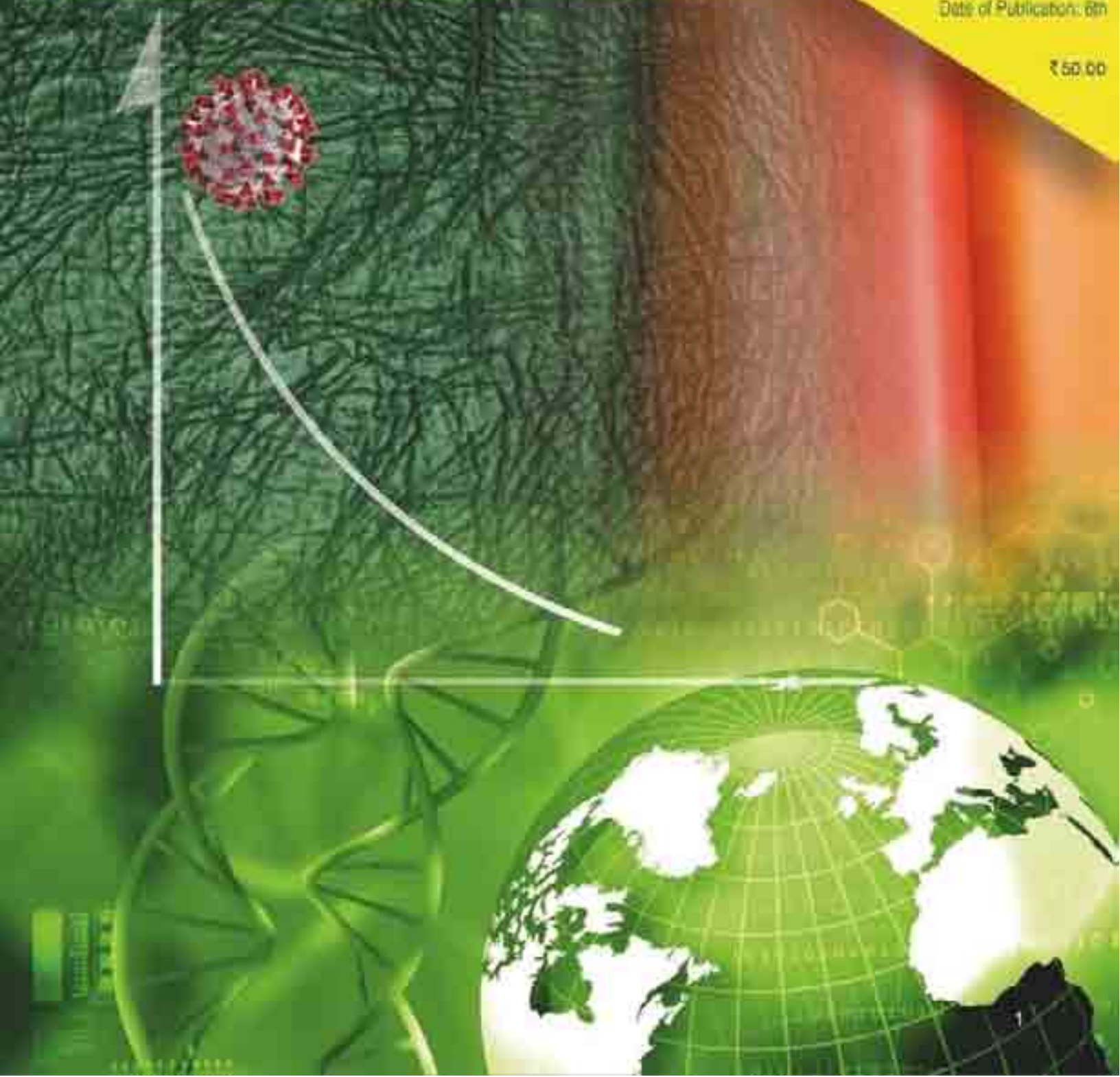
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Our Activities

- An Association with over 600 members from India and abroad working since last 68 years for the growth and development of Leather and its allied industries.
- Organize seminars, symposiums, workshops in order to share information, knowledge & latest development and interactions for the benefit of all concerned.
- Organize Human Resource Development programmes on regular basis.
- Publish for over 60 years, a technical monthly journal namely "Journal of Indian Leather Technologists' Association" (JILTA), widely circulated through out the World.
- Publish books for the benefit of the students at various levels of study, for the Research Scholar and the Industry.
- Work as interface between Industry and the Government.
- Assist Planning Commission, various Government Institutions, Ministry and autonomous bodies to formulate appropriate policies for the growth of the Industry.
- Assist small and tiny leather goods manufacturers in marketing their products by organizing LEXPOs in Kolkata and different parts of India.

Indian Leather Technologists' Association

[A Member Society of International Union of Leather Technologists' and Chemists Societies (IULTCS)]

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JOURNAL OF INDIAN LEATHER TECHNOLOGISTS' ASSOCIATION (JILTA)

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JOURNAL OF INDIAN LEATHER TECHNOLOGISTS' ASSOCIATION (JILTA)

Indian Leather Technologists' Association is a premier organisation of its kind in India was established in 1950 by Late Prof. B.M.Das. It is a Member Society of International Union of Leather Technologists & Chemists Societies (IULTCS).

The Journal of Indian Leather Technologists' Association (JILTA) is a monthly publication which encapsulates latest state of the art in processing technology of leather and its products, commerce and economics, research & development, news & views of the industry etc. It reaches to the Leather / Footwear Technologists and the decision makers all over the country and overseas.

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(Member Society of International Union of Leather Technologists and Chemists Societies)

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(Member Society of International Union of Leather Technologists and Chemists Societies)

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Creating Sustainable Wealth from Waste



It is no secret that we need more sustainable materials if we hope to revive the planet. Bio-derived materials are one potential option, but they must be economical if anyone is going to use them. For instance, a better bio-based milk jug would be great. However, if the milk sells for \$20 per gallon because the cost of the jug increases from \$1 to \$17, no one will buy it.

Take lignin, for example. Lignin is a component of plants and trees that provides strength and stiffness to help the flora stand up to what Mother Nature throws its way. In the pulp and paper industry, however, lignin is a waste left over from making paper products. This type of lignin, known as technical lignin, is considered the dirtiest of the dirty, something that is not usable—except to burn for heat or to add to tires as filler. The researchers say this widely available resource—about 100 million tons of technical lignin waste is generated annually in pulp and paper mills around the world—can be much more valuable. Researchers have demonstrated that it is possible to efficiently turn industrially processed lignin into high-performance plastics, such as bio-based 3D-printing resins, and valuable chemicals. An economic and life-cycle analysis reveals the approach can be competitive with similar petroleum-based products, too. A paper describing the new method was published in *Science Advances*. The work was supported primarily by funding from the National Science Foundation Growing Convergence Research (NSF GCR) program, which aims to solve problems through multi-pronged, interdisciplinary collaboration.

“The ability to take something like technical lignin and not only break it down and turn it into a useful product, but to do it at a cost and an environmental impact that is lower than petroleum materials is something that no one has really been able to show before,” said Epps, who leads the NSF GCR efforts at UD and is the Allan and Myra Ferguson Distinguished Professor of Chemical and Biomolecular

Engineering. He also holds a joint appointment in the Department of Materials Science and Engineering.

One of the main problems with upgrading lignin is that most of the processes to get it done operate at very high pressures and are expensive and hard to scale. Major drawbacks of current industrial techniques include the safety concerns, capital costs and energy consumption associated with traditional solvents, temperatures or pressures used in the process. To overcome these challenges, the research team has replaced methanol, a traditional solvent used in lignin deconstruction, with glycerin so the process can be performed at normal (ambient) atmospheric pressure. Glycerin is an inexpensive ingredient used in liquid cosmetics, soaps, shampoos and lotions for its moisturizing capabilities. But here, the glycerin helps break down the lignin into chemical building blocks that can be used to make a broad range of bio-based products, from 3D-printing resins to different types of plastics, flavor and fragrance compounds, antioxidants and more.

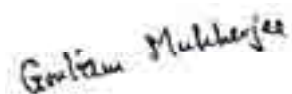
Glycerin provided the same chemical functionality as methanol, but at a much lower vapor pressure, which eliminates the need for a closed system. This change allowed the researchers to do the reaction and separation steps simultaneously, leading to a more cost-effective system. Operating at atmospheric pressure is safer. Just as important, it also provides a straightforward route to scale beyond small batches and run the process continuously, creating more material with less labor in a cheaper, faster process. The process was repeatable and consistent in nature. The work showed that the team’s low-pressure method can reduce the cost of producing a bio-based pressure-sensitive adhesive from softwood Kraft lignin by up to 60% in comparison to the higher-pressure process. The cost advantage was less pronounced for the other types of technical lignins used in the study, but softwood Kraft

lignin is among the most abundant types of technical lignin generated by the pulp and paper industry.

While the analysis demonstrated that yield plays a major role in plant economics, the cost to operate the new, low-pressure process was significantly lower than that of the conventional process in all cases because of reduced capital costs and the generation of valuable co-products. Researchers have also performed a life-cycle assessment to understand how much greenhouse gas (e.g., carbon dioxide) emissions result from the materials production. Having a good handle on the costs at

each step can help researchers explore ways to optimize the process and the material supply chain infrastructure.

The above model and inspiration can help our leather industry achieve sustainable revival of its waste to wealth.



Dr. Goutam Mukherjee
Hony. Editor, JILTA

Read and Let Read :-

JILTA

Tell me and I forget, teach
me and I may remember,
involve me and I learn

Stahl Campus®



As an active proponent of responsible chemistry, Stahl has established the Stahl Campus® training institute in its Center of Excellence for sustainable leather technologies in Kanpur. With our Stahl Campus® Leather Modules, we can offer training and information, such as responsible chemistry and sustainability in leather production. We believe that in this way, we facilitate transparency that inevitably will lead to a better supply chain with responsible chemistry.

Our approach is modular, making it easy to tailor learning programs to specific needs. Stahl Campus® has at its core the drive to unlock human potential and make that new

competitive advantage. By providing the possibility of sharing knowledge, we embrace our role in the dynamic leather and chemical industry. Stahl Campus® is a great opportunity to strengthen skills and capabilities in order to make working methods more efficient by sharing experiences and studying products and procedures.

If you're interested to receive more information on Stahl Campus®, please contact Prasanna Maduri (Prasanna.maduri@stahl.com).

If it can be imagined, it can be created.

We imagine sustainable solutions for the beamhouse and tanning process

Stahl BeTan®



Tanners are facing growing environmental challenges as the market increasingly demands that high-quality leathers are produced more responsibly. Contributing to a more ecological leather production process, our responsible beamhouse portfolio helps tanners meet these challenges without compromising on the quality of the leather.

The Stahl BeTan® portfolio consists of a complete range of responsible solutions for every step in the beam house and tanning process, from soaking to liming and bating. Using the best-in-class responsible technologies from the Stahl BeTan® portfolio, tanners can reduce their water consumption and the amount of sulfides, solids and salt used during leather production.

Moreover, it can result in a shorter production process. Building on years of experience in beam house operations and acquiring the best technical experts in the world, Stahl has become the go-to partner when it comes to sustainable beam house and tanning solutions. Our Stahl BeTan® solutions demonstrate Stahl's continuous commitment to Responsible Chemistry, aimed at reducing the environmental impact of leather-making.

If you would like to know more about Stahl BeTan®, and what we can do for your business, visit stahl.com or contact david.sabate@stahl.com

stahl.com



STAHL ACHIEVES CERTIFICATION FOR ITS LIFECYCLE ASSESSMENT SYSTEMS IN PARTNERSHIP WITH SPIN 360

Stahl, has taken an important step toward realizing its target of having lifecycle assessment (LCA) data for all strategic products by the end of 2023. By working closely together with Spin 360, a tech-enabled sustainability consultancy, Stahl has achieved certification of LCA data generation systems, allowing verifiable information to be collected for its products.



LCA is a methodology that measures the impact of any product on the environment over the course of its life. The LCA methodology can provide quantitative data in a format that permits comparisons to be made. The certification of LCA data generation systems is a foundational step to ensuring the accuracy and reliability of future LCA analyses.

Through close collaboration, Stahl and Spin 360 have implemented an Environmental Product Declaration (EPD) system – certified by Bureau Veritas – at Stahl’s site in Palazzolo, Italy. An EPD is an independently verified and registered document that communicates transparent and comparable information about the environment impact of products across their entire lifecycle. This implementation underlines Stahl’s commitment to enabling the sustainable development of its industry by driving accountability and transparency.

Michael Costello, Stahl Group ESG Director: *“One of Stahl’s strategic ESG goals is to collect verifiable, high-quality LCA data for its products, thereby paving the way to lowering the environmental impact of the whole supply chain. This EPD system certification is an important achievement, and a key step in realizing this goal. Looking ahead, we’ll continue to work with our partners to enable our certified LCA data availability and shape a better industry.”*

Federico Brugnoli, CEO of Spin 360: *“We are very proud to have supported this complex process that will ensure the complete reliability of Stahl’s LCA data. Now we will look at the next steps in supporting Stahl, focusing environmental footprint reductions through science-based evolution of the industry. We’re confident that – together – we can ensure a better future for us all.”*

(Stahl News Room - November 10th, 2021)

STAHL TO SET SCOPE 3 CARBON EMISSION TARGETS BY MID 2022



Stahl, announces that – by the end of Q2 2022 – it will extend its GHG reduction targets to cover Scope 3 emissions. This step underlines Stahl’s commitment to aligning its strategy with the 2015 Paris Climate Agreement goals, updated at the recent COP26 in Glasgow.

Between 2015 and 2020 Stahl reduced its Scope 1 and 2 (direct) GHG emissions by 37%, and has committed to a further 2% reduction each year to 2030. Scope 3 emissions cover all the indirect emissions that can occur in a company’s value chain, including raw material acquisition, transportation, and the end-of-life impact of its products. By

focusing on Scope 3 emissions, Stahl is committing to de-fossilizing its supply chain and ensuring further accountability for its total environmental impact.

Michael Costello, Stahl Group ESG Director: “Only by focusing on reducing Scope 3 emissions can we accurately align our de-fossilization strategy with the global goal of limiting global average temperature increase to 1.5°C, as agreed at the 2015 Paris Climate Agreement and the COP26 in Glasgow. We look forward to working with partners across our industry and value chain to make this happen.”

(Stahl News Room - November 12th, 2021)

STAHL EXPANDS NUMBER OF ZDHC LEVEL-3-CERTIFIED PRODUCTS



Stahl, has achieved ZDHC Gateway certification for 400 more of its products, bringing the total number of Level 3 certified products to 1800. This achievement underlines the company's commitment to the ZDHC mission of implementing chemical management best practice across the industry.

ZDHC certification aims to enable companies working in the footwear, apparel, and accessories industries to demonstrate their commitment to responsible chemical management, with the ultimate goal of zero discharge of hazardous chemicals. In February 2020, Stahl achieved ZDHC Gateway Level 3 certification for its leather chemicals and performance coatings portfolios. It has now achieved the same certification for 400 additional products, bringing the total

number of Level-3-certified products to 1800 formulations. Several hundred more Stahl products are expected to be certified to Gateway Level 3 in 2022.

To achieve the most recent certifications, Stahl's formulated chemical products and a number of raw materials were tested against ZDHC's Manufacturing Restricted Substances List (MRSL) by testing lab Eurofins | Chem-MAP. Chem-MAP® was also used to audit chemical management and stewardship processes at three of Stahl's sites in Europe to verify that its formulations were ZDHC-compliant. In total, six of Stahl's sites have now passed this Level 3 audit.

Michael Costello, Group Director Environmental, Social & Governance Stahl: "This latest expansion of our ZDHC-compliant portfolio is a milestone in the journey of eliminating restricted substances from the entire supply chain. We share ZDHC's mission of reducing the environmental impact of the industry."

Georgina Mawer, Head of Technical Eurofins | BLC: "Certifying Stahl to ZDHC MRSL Level 3, undeniably re-affirms their commitment to chemical transparency and sustainability in the supply chain. We are proud to have been able to work closely with the Stahl team and support their goal of achieving ZDHC MRSL Level 3 across their portfolio."

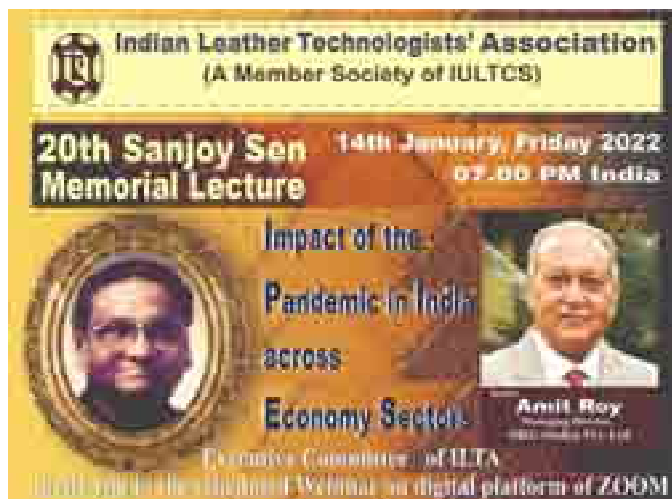
(Stahl News Room - November 29th, 2021)



From the desk of General Secretary



WEBINAR ON “20TH SANJOY SEN MEMORIAL LECTURE”



The “Sanjoy Sen Memorial Lecture” was organized by our association on digital platform at 7.00 pm on 14th January’ 2022.

The program resumed with the introductory speech delivered by Mr. Susanta Mallick, General Secretary, ILTA, followed by the Welcome Address delivered by Mr. Arnab Jha, President, ILTA.

Mr. Jha welcomed to all the dignitaries and participants from different sectors like members of ILTA and other associations, organizations, academic institutions, industry etc. In his speech Mr. Jha elaborated the eventful life of Late Sanjoy Sen and his role as President of ILTA during 3 decades.

Mr. Mallick then declared the name of the following students who secured the topper position in B.Tech, Leather Technology from different institutes and awarded with Sanjoy Sen Memorial Medal :-

- Ms. Ragini Swaraj** from Muzaffarpur Institute of Technology, Muzaffarpur, Bihar in 2021.
- Mr. Abhay Kant Singh** from Harcourt Butler Technical University, Kanpur, U.P. in 2021.



Mr. Mallick then announced the name of **Ms. Pranita Chakrabarti** who was to receive Sanjoy Sen Gold Medal for topping B.Tech Leather Technology as Composite Topper of 4 years in 2020 from GCELT.



Also Mr. Mallick declared the name of the following students who were to receive the Dr. Prafulla Kumar Basu Memorial Scholarship:-

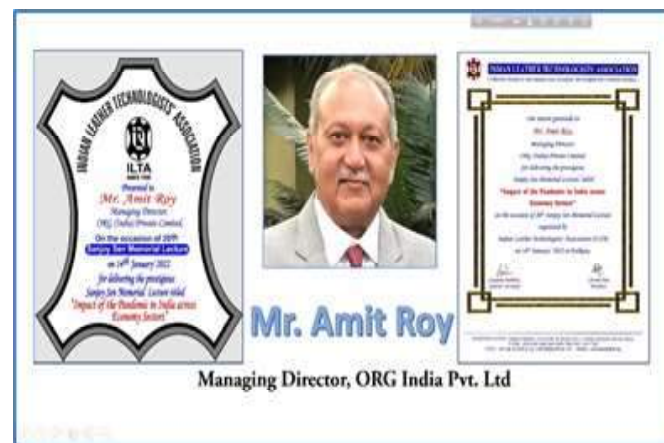
- Mr. Biswajit Jana
- Ms. Juin Kundu
- Ms. Ayugma Sengupta
- Mr. Tuhin Jana





After concluding the award presentation session Mr. Jha introduced the honorable speaker of the day, Mr. Amit Roy, Managing Director, ORG India Pvt. Ltd. and called on him for delivering the prestigious Sanjoy Sen Memorial Lecture titled **"Impact of the Pandemic in India across Economy Sectors"**.

Before starting his lecture Mr. Roy offered his homage to Late Sanjoy Sen and delivered the Sanjoy Sen Memorial Lecture. In his lecture Mr. Roy emphasized the all such sectors including Leather those have been badly affected with Covid-19 situation. He also explained that how some of the sectors have been benefited with the Covid 19 situation.

However the program came to end with offering the Vote of Thanks by Mr. Mallick.



There were around 80 - 90 participants over Zoom platform. Video recording of the entire program is available on the official YouTube  channel of ILTA (ILTA Online) and Facebook  of ILTA (Indian Leather Technologists Association) the website of the Association – www.iltaonline.org.

WEBINAR ON 4TH PROF. S. S. DUTTA MEMORIAL LECTURE

The above is proposed to be organized by our association on 2nd February' 2022 on the 2nd day of IILF, Chennai like every year. This year also this would be organized on the 2nd day of IILF, Chennai, in April or May when IILF will be held. The decision is taken in consultation with Mr. Jagannathan, President, ILTA-Southern Region.

Details report of the program will be published in the March' 22 issue of JILTA.

WEBINAR ON 11TH PROF. MONI BANERJEE MEMORIAL LECTURE

The above is proposed to be organized by our association on 15th March' 2022 like every year. This year also this would be organized on digital platform due to Covid 19 situation.

Details of the program will be intimated in due course.

— X —



BEREAVEMENT

With profound grief and a heavy heart, we announce the sad demise of Mr. B. D. Bhaiya on 24th January' 2022. He was an eminent Industrialist of Leather Fraternity and a Senior Life Member of ILTA.

May his soul rest in peace and May God give strength to the members of the bereaved family.



(**Susanta Mallick**)
General Secretary

YOUTUBE CHANNEL & FACEBOOK PAGE OF ILTA

An official **YouTube Channel** namely **ILTA Online** and a **Face Book Page** namely **Indian Leather Technologists' Association** has been launched for sharing the activities of our Association since November' 2020 and July' 2021 respectively.

You may find all the Lives / Video recordings of different Seminar, Symposiums & Webinars on both of these social medias along with our website **www.iltaonleather.org** time to time.

You are requested to kindly do **Like & Subscribe** the YouTube Channel and **"Follow"** the FaceBook Page to get regular updates on the activities of our Association.

RECEIVING HARD COPY OF JILTA EVERY MONTH

Members want to have the hard copy of JILTA every month or any particular issue, kindly inform us by email or post, whichever is convenient.

In case we do not receive any communication from you for a hard copy, we will continue sending e-copy of the same to your email id available with us. You may please verify your email id with our office at the earliest.

PUBLISH YOUR TECHNICAL ARTICLE

Faculties, Research Scholars and students of various Leather Institutes may wish to publish their Research / Project papers in an Article form in this monthly technical journal, JILTA.

Interested author may sent their paper (in MS Word format) along with a PP Photograph and Contact details like Email, Mobile etc. to our email IDs : admin@iltaonleather.org / jiltaeditor@gmail.com

Members are requested to :-

- a) Kindly inform us your '**E-Mail ID**', '**Mobile No**', '**Land Line No**', through E-Mail ID: admin@iltaonleather.org or over Telephone Nos. : 24413429 / 3459. This will help us to communicate you directly without help of any outsiders like Postal Department / Courier etc.
- b) Kindly mention your **Membership No.** (If any) against your each and every communication, so that we can locate you easily in our record.

General Secretary and the Members of the Executive Committee are available to interact with members at 19.30 hrs, over Phone / Conference call on every Thursday



INTERNATIONAL UNION OF LEATHER
TECHNOLOGISTS AND CHEMISTS SOCIETIES

WELCOME TO ASIA INTERNATIONAL CONFERENCE OF LEATHER SCIENCE AND TECHNOLOGY



It is with great pleasure, that we invite you to participate in the 12th Asia International Conference of Leather Science and Technology (AICLST), hosted and organised by the New Zealand Leather & Shoe Research Association in the beautiful and picturesque city of Queenstown in New Zealand's South Island on 18-20 Oct. 2022.

Queenstown sits on the shores of the South Island's Lake Wakatipu, set against the dramatic Southern Alps. Renowned for adventure sports, it's also a base for exploring the region's vineyards and historic mining towns. There's bungee jumping off Kawarau Gorge Suspension Bridge and jet-boating on the Shotover and Dart rivers. There is also the possibility of skiing on the slopes of The Remarkables and Coronet Peak.

The three-day programme promises excellence in science, along with practical examples of science impact and the drive to sustainable leather production. We seek to foster strong and lasting bonds between leather scientists across the international community with companies engaged in leather production and chemical companies who deliver the products used to manufacture leather.

Main Topic Areas:

- ❖ Advances in Basic Science of leather
- ❖ Benign chemical developments
- ❖ Cleaner leather production and closed-loop processing
- ❖ High value uses for leather manufacturing by-products and wastes
- ❖ Technologies to advance protection of the environment in the leather industry
- ❖ Advances in detection technologies applied to leather manufacture and quantification
- ❖ Intelligent leather technologies – Industry 4.0
- ❖ Design innovation for fashion leathers



Solidaridad

Solidaridad Network is a global civil society organization providing efficient, scalable and economically effective and innovative sustainability solutions in various agricultural and industrial commodities such as:



switchasia
GRANTS PROGRAMME



EFFECTIVE WASTE MANAGEMENT AND SUSTAINABLE DEVELOPMENT IN KOLKATA LEATHER CLUSTER(BANTALA) 2020 -2023

Circular Economy

Effective solid waste
management

Capacity building
programme



EFFECTIVE WASTE MANAGEMENT
AND SUSTAINABLE DEVELOPMENT
KOLKATA LEATHER CLUSTER

Trainings on Occupational
Health and Safety

Robust public- private
partnership

Efficient water
consumption practices

PROJECT PARTNERS IN ASIA



Pradipta Konar, Program Manager-Leather (Kolkata): pradipta.konar@solidaridadnetwork.org

Solidaridad Regional Expertise Centre

158/5, Prince Anwar Shah Road, Kolkata-700045

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Bio-enzyme - True Solution against Pollution !

The leather industry is known to be constantly battling the chemicals that are discharged during the tanning process. Having long been at the epicenter of several discussions and discourses around pollution, the industry is surely waking up to embrace green technologies and solutions in its production. One such eco-friendly technology is the use of natural or bioengineered enzymes that can drastically reduce the level of toxicity in the discharges from the industry.

Enzymes are biological elements that act as catalysts in chemical reactions, i.e., without being used up in the reaction itself. They find relevance in almost every sphere of our lives, from human anatomy to food industry and medicine manufacturing among others. In leather production, enzymes prove to be highly beneficial in replacing harmful chemicals for various crucial processes such as soaking, dehairing, bating and de-greasing the hides.

For example, in the soaking process, enzymatic treatment can help get rid of nonylphenol ethoxylate- (NPE) and alkylphenol ethoxylates- (APE) based surfactants. The NPE/APE- based surfactants are highly efficient but produces disastrous impact on the marine life—the reason it has been moved under RSL (Restricted Substances List).



Recombinant DNA technology, protein engineering, and rational enzyme design are the emerging areas of research pertaining to environmental applications of enzymes. In bating operation, we are using mainly sterile enzymes (pepsin or trypsin). They are prepared in disinfected conditions, assorted with fine wood flour and ammonium salts (sulphate or chloride). Ammonium salts keep the pH at best level for the action of the enzyme. It is very simple that more use of enzyme will be equivalent to less use of hazardous leather chemicals. As a result, the chemical oxygen demand and toxic waste discharge will eventually come down with time.

Hydrogen Sulphide gas exposurer is one of the massive deadlocks of Kolkata and other leather geographic location for its lethal effect on human being. The excessive use of Sodium sulphide or sodium hydro sulphide caused higher amount of sulphide ions leftover in the effluent and as a result it reacts with the acidic media presents in the discharged liquid and forms hydrogen sulphide gas. This gas is toxic for the human as well as it decays all the electronic equipment used in leather industry. To overcome this hurdle, Alkaline protease enzyme is the only proven option that could minimize or completely replace the sodium sulphide used in the dehairing (mostly known as Liming) operation. Sodium sulphide reduces disulfide bonds in keratin (Insoluble structural protein) present in hair and epidermis and thereby detaches them from skin/hide (Insoluble structural protein). Removal of hair from skin will reduce the toxic chemical and biological load on the final discharge of the tannery. We called this process as hair burning process. This burnt hair also affect the effluent by increasing BOD, COD, TSS and partially TDS. But this enzyme will

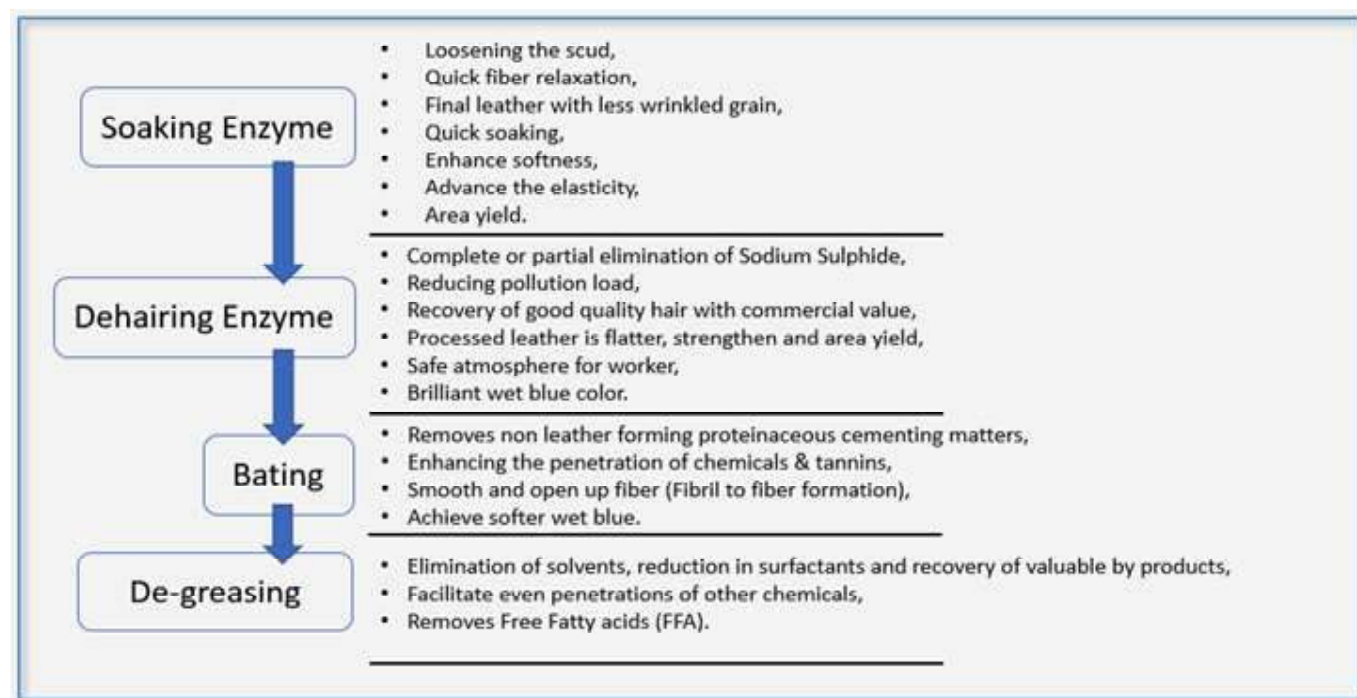
not burn or partially dissolve the keratin. It will dissolve the keratin bulb so that it can come out easily by mechanical agitation and swelling rather than without any chemical action. Not only hair removal, proteolytic deprivation of decorin and subsequent removal of proteoglycan aggregates show a vital role in the opening up of the collagen fiber bundles during enzymatic dehairing. So theoretically, we can reduce the percentage of lime as well, to achieve the conventional leather quality with the added reduction of TDS, TSS, BOD, COD and also most importantly reduced the formation of hydrogen sulphide gas. Self-life of each equipment will also drastically improve if we can start to standardize enzyme-based leather making process for every leather geographics in cluster level.

Not just to take care of the environment, bioengineered enzyme has several polishing effects on the characteristic of finished leather. There were studies on the use of enzyme and comparative tests with other parallel chemicals that shows extraordinary functional activity rate in all the stages of tests. Concentration, processing time and type of enzyme were varied. Enzymatic activity evaluates on collagenous, keratin, fat and scanning electron microscopic studies of hides. Proteases can easily hydrolyze the protein of dermatan sulfate so that water can move around inside the pelt without any hindrance and contraction of the basal layer. Additionally, remove the water insoluble nonstructural protein. Whereas Lipases that break fats, oils and greases present in the hypoderm layer and Keratinases can hydrolyze the keratin protein of hair and epidermis.

Solidaridad is promoting the use of enzymes in the leather cluster in Kolkata. The organization is working on an accelerated momentum for implementing trials on enzymatic processes in the facilitated tanneries. The team has already conducted production level trials, and successfully motivated the tanneries to standardize their processes through enzymatic treatments. With the support of CLCTA, Solidaridad has conducted production level trials in tanneries and the tanneries welcomed this initiative wholeheartedly.

The road ahead for the leather industry has to be paved in green solutions going forward. With the introduction and standardization of eco-friendly technologies such as enzymatic treatments in the tanneries, the Indian leather industry is bound to bounce back with a cleaner, greener and sleeker image like never before!

Advantages of enzyme functionality in Leather Industry



TRANSPORTATION COST INVOLVED DURING SUPPLY OF RAW HIDES AND SKINS TO A MODEL TANNERY CLUSTER (RANIPET & VELLORE) IN TAMIL NADU

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Abstract :

Total transportation cost involved per day in transporting raw hides and skins to a model tannery cluster (Ranipet & Vellore) in Tamil Nadu is discussed.

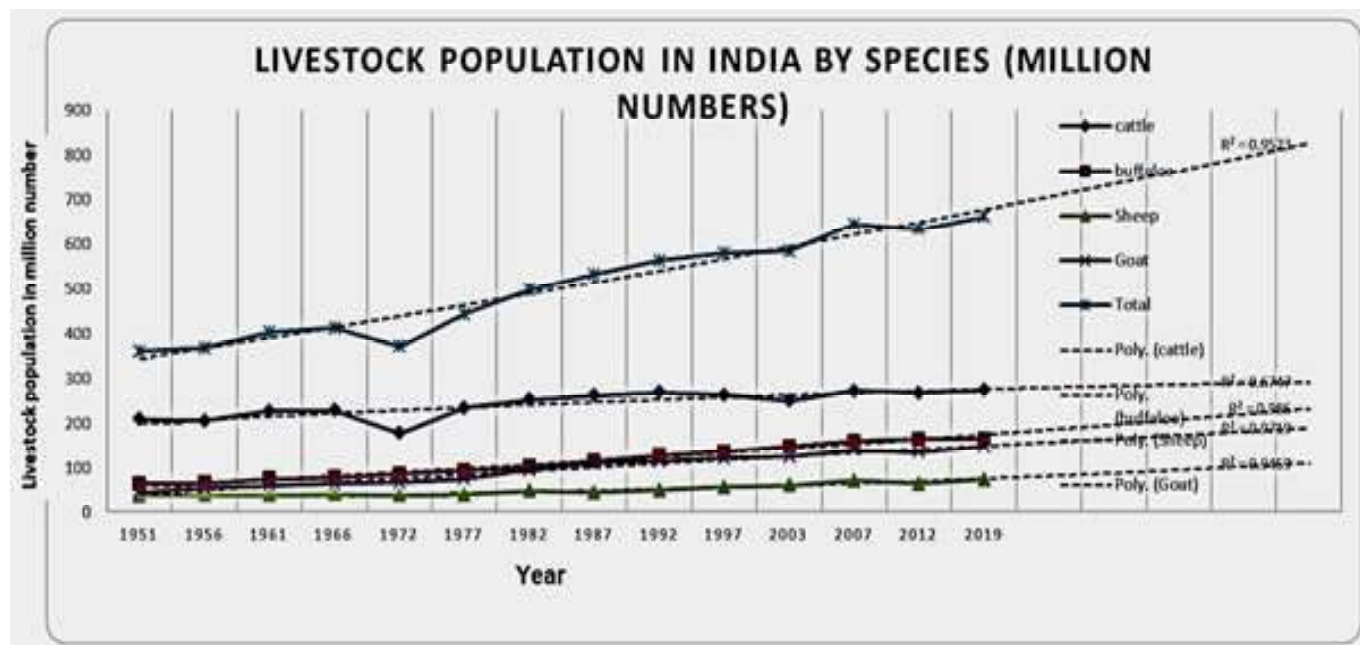
1.1. Introduction :

Hides (from cattle and buffaloes) and skins (from goats and sheep) in India are recovered from meat industry as a by-product and from the animals that die by natural death. The materials,

which originate from meat industry are called slaughtered hides/skins and those from mortality are fallen hides/skins. Annually 23 million cattle hides, 28 million buffalo hides, 82 mil goat skins and 30 mil sheep skins are effectively recovered from these sources and being available to Indian leather industry. Of the available raw material in the market, the proportion of slaughtered hides constitutes 75% and that of skins form 97% ¹

The livestock population in India by species in million numbers as obtained from the National Dairy Development Board is listed in Table 1². The trend lines for future are drawn using Excel.

TABLE - I
Livestock population in India by species in million numbers.



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Animals are slaughtered at various levels in India. The primary sources are organized export oriented abattoirs, urban slaughterhouses and rural slaughter. There are only very few export oriented private slaughter houses producing buffalo meat and such abattoirs account for only around 10% of the buffalo hides available in the country. These hides are directly sold in salted condition either to wholesale dealers or tanners. Urban slaughter accounts for 60% of the slaughtered hides and skins in India. Around 3000 urban slaughterhouses function in India under the control of local bodies.

They serve as common facilities enabling individual butchers to get their animals slaughtered and carry the dressed carcasses to the retail outlets. Butchers make use of the facilities and pay fees to the local body. The hides and skins are sold to local collectors on the same day, who apply salt as soon as they collect and in turn sell to the dealers through weekly markets or in the wholesale markets.

Rural slaughter is taking place in almost all the villages numbering around 600,000 in India and the intensity varies according to the local meat consumption practice. The proportion of slaughtered hides and skins originating from rural areas accounts for nearly 40% of total material available in the country. They go through long market chain to reach to the tanneries. Initially salting is done by the local butcher and supplied periodically to the regional collectors of nearby towns and from there to weekly markets, wholesale markets and then to the tanneries.

The Supply Chain Management in Leather Sector in Social Context of India including the collection of raw hides and skins is schematically shown in Figure 1 and it is evident that it is not stream lined or well organized. The supply chain consists of a number of middlemen, which leads to an increase in the supply chain cost that is directly reflected on the price of the raw material procured by the tanners².

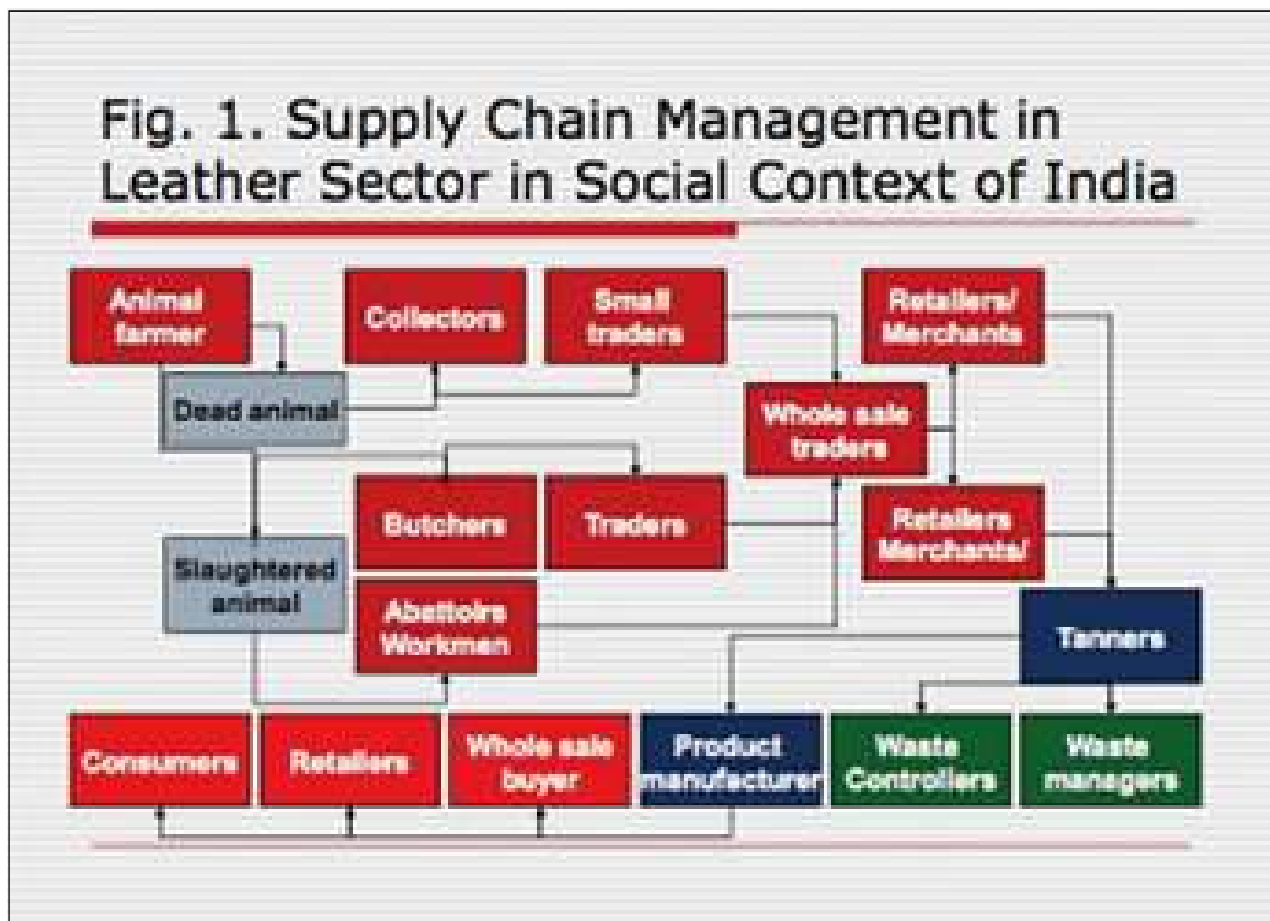


Figure 1: Current system of distribution of raw hides and skins from slaughter houses to tanneries.

1.2. Raw material wealth of Tamil Nadu :

The livestock population data for cattle, buffalo, sheep and goat were obtained from the Department of Animal Husbandry and Veterinary Services (www.agritech.tnau.ac.in). The percentage slaughtered (cattle 20%, buffaloes 41%, sheep 30% and goats 40%) was obtained from the Ministry of food

processing industries (www.mofpi.nic.in). From this data, the number of animals slaughtered and the total weight of hides and skins were calculated based on the assumption that cow and buffalo hides weigh 14kg and 20kg on the average whereas goat and sheep skins weigh 1kg and 1.5kg respectively. The estimated availability of hides and skins district-wise are presented in Table II³.

TABLE - II
Estimated availability of hides and skins per year from various districts of Tamil Nadu.

S.No	District	Cattle hides	Buffalo hides	Sheep skin	Goat skins	Total wt (in kg) per day
1	Thoothukkudi	959,029	319,163	540,768	318,399	15,543
2	Erode	549,451	242,464	584,373	533,036	10,967
3	Kancheepuram	621,651	154,434	308,342	389,190	9,045
4	Pudukkottai	682,174	83,955	794,594	498,989	8,646
5	Tirunelveli	504,332	114,758	1,222,310	461,300	8,459
6	Salem	564,223	146,589	355,053	360,336	8,454
7	Villupuram	865,683	33,056	365,307	495,213	8,377
8	Namakkal	285,958	219,878	151,666	462,329	7,827
9	Thiruvallur	324,222	194,532	92,970	321,462	7,324
10	Tiruvannamalai	717,336	22,686	366,752	272,823	6,764
11	Vellore	573,686	34,032	249,682	248,273	5,745
12	Dharmapuri	452,410	64,731	297,945	188,084	5,498
13	Tiruchirappalli	429,823	46,971	212,745	486,748	5,148
14	Thanjavur	446,750	28,154	51,736	432,078	4,597
15	Dindigul	250,399	80,731	266,401	258,242	4,346
16	Madurai	349,095	6,205	438,276	512,405	3,919
17	Coimbatore	343,385	36,484	122,813	230,599	3,858
18	Virudhunagar	281,071	20,859	362,282	444,878	3,559
19	Nagapattinam	300,946	31,841	18,701	453,781	3,544
20	Cuddalore	337,692	19,784	47,225	241,378	3,358
21	Karur	121,272	55,581	302,490	166,747	2,735
22	Thiruvallur	269,555	7,665	5,881	311,183	2,588
23	Sivaganga	227,913	7,835	243,791	227,029	2,474
24	Ariyalur	204,746	16,107	73,981	265,237	2,314
25	Ramanathapuram	132,064	3,549	358,633	290,541	1,853
26	Theni	136,791	5,351	87,489	109,370	1,397
27	Perambalur	126,908	5,046	58,458	155,731	1,330
28	Kanniyakumari	89,704	2,509	1,238	118,304	876
29	The Nilgiris	37,372	1,146	1,658	17,751	334
30	Chennai	3,068	2,906	7,027	3,148	101
	State Total	11,188,709	2,009,002	7,990,587	9,274,584	150,980

1.3. Plant capacity :

The per day production capacity of raw skins /hides to finished leather in Tamil Nadu is 1,21,400 kg in Ranipet & Vellore cluster. The detailed capacity of the tannery industries district wise is listed in Table III⁴.

TABLE - III
Details of Tannery Industries from raw to semi-finished / finished leather in Tamil Nadu

S.No.	District	Name of the Consented product	Per Day capacity (in kg)
1	Ranipet	Processing of raw hides to semi-finished / finished leather	1,07,900
2	Vellore	Processing of raw to finished leathers	13,500
	Total		1,21,400

1.4. Assumed model of distribution of raw hides / skins to tannery cluster (Ranipet & Vellore) :

A location in between Ranipet and Vellore, Melvishram is arbitrarily taken for calculating transportation cost incurred for transporting raw hides and skins from various parts of Tamil Nadu to Ranipet & Vellore cluster.

S.No.	District	Melvisharam (distance in km)	Total wt (in kg) per day	Cost per kg/km (assumption)	Total cost incurred in transportation
1	Thoothukkudi	563	15,543	4	62,172
2	Erode	307	10,967	4	43,868
3	Kancheepuram	55	9,045	4	36,180
4	Pudukkottai	335	8,646	4	34,584
5	Tirunelveli	581	8,459	4	33,836
6	Salem	258	8,454	4	33,816
7	Villupuram	128	8,377	4	33,508
8	Namakkal	299	7,827	4	31,308
9	Thiruvallur	88	7,324	4	29,296
10	Tiruvannamalai	92	6,764	4	27,056
11	Vellore	20	5,745	4	22,980
12	Dharmapuri	183	5,498	4	21,992
13	Tiruchirappalli	286	5,148	4	20,592
14	Thanjavur	298	4,597	4	18,388
15	Dindigul	387	4,346	4	17,384
16	Madurai	417	3,919	4	15,676
17	Coimbatore	409	3,858	4	15,432
18	Virudhunagar	474	3,559	4	14,236
19	Nagapattinam	296	3,544	4	14,176
20	Cuddalore	169	3,358	4	13,432

S.No.	District	Melvisharam (distance in km)	Total wt (in kg) per day	Cost per kg/km (assumption)	Total cost incurred in transportation
21	Karur	342	2,735	4	10,940
22	Thiruvallur	294	2,588	4	10,352
23	Sivaganga	414	2,474	4	9,896
24	Ariyalur	256	2,314	4	9,256
25	Ramanathapuram	464	1,853	4	7,412
26	Theni	464	1,397	4	5,588
27	Perambalur	230	1,330	4	5,320
28	Kanniyakumari	663	876	4	3,504
29	The Nilgiris	478	334	4	1,336
30	Chennai	124	101	4	404
	Total	9,374	150,980		603,920.00

1.5. Conclusion :

Every day around Rs. 6 lakh is involved in transporting raw hides and skins from districts within Tamil Nadu to model tannery cluster Ranipet & Vellore.

The procurement of raw hides and skins supply chain can be optimized using simulation software like ARENA / FLEXSIM⁵ or PYTHON⁶ using suitable algorithms⁷ when the data is huge.

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IULTCS EURO CONGRESS CALL FOR PAPERS REMINDER



Organisers of the upcoming IULTCS Euro Congress event are calling for English language abstracts for papers around key leather industry topics.

Abstracts must be submitted before February 28, 2022. The congress itself is due to take place in Vicenza, in September 2022.

The conference will revolve around four key topics as part of its theme, titled Rinascimento: The Next Leather Generation.

These are :

- Product innovation
- Innovation of processes
- New approaches for the development of standardised methods
- News about environmental developments.

Interested parties are invited to send an abstract and a presentation of their work to the organising committee via the event portal at www.iultcs2022italy.org.

To find out more about the event in September 2022, **subscribe to ILM**, download our **app**, and access our most recent magazine issue, January/February 2022, where we spoke to President of the organising committee Dr Giancarlo Lovato about all the plans for the event and why it will be such a pivotal coming together of the European leather industry.

(Source : ILM – 24/01/2022)

ROYAL SMIT & ZOON PARTNERS WITH ITALIC FOR CHROME - FREE SNEAKERS



Royal Smit & Zoon has partnered with Italic, a direct-to-consumer e-commerce marketplace in the U.S., to launch a pilot program of Zeology-tanned leather sneakers.

The sneakers are reportedly the first chrome-free tanned leather sneakers in the U.S. market, according to Italic.

The footwear is manufactured by Tophide, a chrome-free shoemaker that focuses on producing shoes with traditional methods and modern, chrome-free leather to “ensure safer conditions for their employees and community”.

A statement said: “This lightweight, comfortable hi-top is made from a unique, high-quality leather composition that optimises grain tightness and heat-resistance. Using tannery-specific Zeology technology, our leather is treated sustainably without compromising on overall durability.”

The leather is produced at Xuzhou Nanhai Tannery, a partner of Zeology based in China.

(Source : ILM – 27/01/2022)

TOWARDS ZERO ENVIRONMENTAL IMPACT

The Leather Chemists met in Arzignano on 26 November to talk about Future Restart and Innovation in the leather sector

The AICC Veneto Conference held in Arzignano on last 26 November fulfilled its promises reflected in the title “Restart – Future – Innovation”. In fact, five important reports were

presented on the stage of the Charlie Chaplin movie theatre that allowed us to look up and hope for a less uncertain future thanks to technical-scientific progress and the prospect of new important investments in the purification field.



After the greetings of president Roberto Mariano Mecenero, who encouraged his colleagues of the supply chain to play as a team “because together we can do great things and 2022 can become the year of the sector’s relaunch”, the Conference got to the heart of the tasks with the report by Riccardo Pasquale (GSC Group) dedicated to the presentation of the LIFE GOAST Project results realised with the contribution of the European Commission. Started in July 2017 and concluded in December 2021, the project aimed to demonstrate the effectiveness of a metal free tanning technology, an alternative to chromium, to produce high quality leather, especially for the automotive sector. Goast technology – explained the speaker – is based on the use of a combination of different polymer-based compounds used following a specific application protocol. The resulting leather scraps, being free of chromium and other heavy metals, can be completely recycled. The results of the project have been judged very positive with overcoming challenges concerning the organic load increase which degrades slower, thus requiring more time.

The microphone was handed over to Nicolò Panarotto and Michele Vallarsa, two former students of ITS Arzignano Green Leather Manager course, now employed in local companies, who presented a work dedicated to “Sustainability in the Riviera phases”. The aim of the research was to demonstrate that with a new approach in the mechanical and chemical processing of the coat it is possible to reduce the polluting load. How? By trimming, green fleshing and splitting hides in order to lower (by 30%) the leather volume to be tanned and consequently the waste produced, reducing the quantities of chemical product, water and energy necessary for the process.

Gustavo Defeo (ARS Tintoria) carried out a report entitled “Measuring the circularity of leather and alternative materials” in which he talked about the objectives of the European Green Deal and the need to be able to measure and compare sustainable materials. The researcher described the results of a comparative study he carried out on the upper of three shoes: one vegetarian, one produced with “apple leather” and one with metal-free leather with a mixed synthetic/vegetable process. The analyses carried out with the carbon 14 method have shown that the material of the first upper derives from 100% petroleum, the one in apple leather contains 80% of PU and 20% of organic waste, while the leather upper offers a bio content equal to 83%. Hence the need to get to the labelling of materials to break down false myths and offer more transparent information to consumers.

The intervention of Cesare Dal Monte (GER Elettronica) dedicated to traceability, explained how to integrate it into the tanning process to obtain reliable data in all processing phases, obtaining important advantages in terms of transparency and quality guarantee, but also “because – said the manager, quoting an ASSOMAC source – the data and their interpretation will be the lifeblood of the companies of the future”.

Equally interesting was the last report by Nicola Muraro, consultant of the Veneto Leather District, entitled “Tanning towards zero environmental impact” which suggests a change of pace by all operators to carry out an ambitious project centered on eight “construction sites” to achieve full sustainability among which the issues of circular tanning, carbon neutrality and clean chemistry stand out and for which the Veneto district aims to obtain funding related to the Recovery Plan. In this regard Muraro focused in particular on the need to redesign the local purification system which today shows all the limits of a plant designed over 50 years ago. The key point of the new system would be the separate management of the various types of sludge through the creation of individual pipes divided by type in order to facilitate the purification but also the recovery of proteins, chromium and salt.

At the end of the conference, President Mecenero nominated and invited the new “honorary” members of the Association to the stage. They are: Santo Mastrotto, Gilberto Adami, Biagio Siani, Biagio Naviglio, Giancarlo Falaschi and Giovanni Gola.

(Source : Tannerymagazine.com – 15/12/2021)

THE LEATHER INDUSTRY IS NOT IMMUNE TO GEOPOLITICS



Mike Redwood recalls some of the toughest points in his career, when the necessity of leather work and omnipresent geopolitical turmoil put him and colleagues in dangerous and sometimes fatal situations.



I flew to El Salvador 40 years ago this month, and recently I was remembering the day in 1977 when my deputy at the ADOC tannery had been arrested at an army roadblock. It was a Thursday and we had until the weekend to get him out or he would most likely turn up as a corpse on the far side of the volcano.

We got Ernesto out on the Saturday morning, thanks to the Herculean negotiating skills of our Admin Chief Sr. Rivas. It was, at that moment, clear to us all that the leather industry was not immune from geopolitics; we needed to take much greater precautions at our remote countryside plant, 45 minutes' drive out from the capital.

In 1977, a contested election and unclear U.S. foreign policy had tipped a volatile political situation in the country into the start of a lengthy civil war. During that year, our dentist was shot and killed because of his links to the University, and a young man from our little group of 10 small houses was kidnapped. He was the Head of Tourism and from a rich family which paid out a hefty ransom, only learning when his body was later found that he had died from stray bullets during the kidnap.

Worried about the security of my own young family, we left at the start of 1978 and returned to Europe, and the two other

British employees running the rubber plant and the shoe factory left shortly after, although not before one had been forced to drive an armoured SUV through the perimeter fence to escape kidnap or murder.

The famous American author Joan Didion wrote quite a shocking short book on "Salvador" after a trip she made in 1982, the same year I had the opportunity to return to help the founder, Don Roberto Palomo, keep the business alive in difficult circumstances. He too, as a prominent personality, had left to live in nearby Costa Rica where ADOC had many shoe shops and a small shoe factory, putting a brave Dutchman in charge in El Salvador to hold the fort during the war.

I am glad she had not written her book before my trip, as the easy way we travelled to the tannery each day, enjoyed our evenings and talked our way through roadblocks was alien to the way she saw things. Most of my old team, including my wonderful PA, Carolina Linqui, were still present and it was easy slotting back into the jigsaw.

A heavily guarded Don Roberto felt able to return briefly to El Salvador during my trip and we worked together on prioritised projects. He flew home to Costa Rica a little before I left but, on my last day (Friday, January 29, 1982), I had a telephone call from him to discuss our plan of work for the next few months in the tannery. The lengthy call went well into the normal lunch period, and I heard him shouting to his team that he would follow them later to the little Costa Rican restaurant they preferred.

He never made it, instead walking into an attempted kidnapping on his way to his car. He escaped with the help of a young local policeman but was badly shot and flown to Miami for treatment; I was able to visit him in the hospital that weekend on my way back to the UK. He survived three bullets in his arms and legs and continued to actively run the business until his death at 84 in 2009; although the stress of the event put a huge strain on all his family.

The leather industry is of course much wider than merely Central America and, in my limited career, we have seen problems from Northern Ireland, through to Ethiopia and Sri Lanka at various times.

While El Salvador was always a powder keg, it was an event in Pakistan that surprised me the most. In August 2012, we were on holiday in Iceland and walking around an outdoor museum

when I received an unexpected call from an Associated Press journalist asking about Warren Weinstein and seeking permission to use a photograph I had taken of him in 2009 at the University of Northampton.

Armed men had broken into his house in Lahore, overwhelming his security team, and kidnapped him. It was the same house where I had stayed with him for six weeks or so while doing a project on the Pakistan leather industry. He had done excellent work there on dairy projects, furniture and in other sectors and, once funding had been found, the Pakistan government were keen that he was involved in the work.

It was easy to see why as his skill, understanding, dedication and energy were outstanding. On the day of his kidnap, he was 48 hours from leaving for retirement at home in the U.S. In January 2015, he was “inadvertently” killed by an American drone attack in the Tribal Areas of Pakistan. He was 73.

Geopolitical uncertainty

As we look out at the world today, geopolitical uncertainty, brinkmanship and military risk-taking is very much back. A leather industry adapting to all the impacts of Covid-19 in terms of resilience, supply chain developments, rising costs and changing markets will have to factor this global belligerence into their thinking; just as they have had to do many times through history. Leather was needed in the past to fight wars and now is required as one of the most sustainable materials to help the fight against climate change and biodiversity loss.

(Source : ILM – 25/01/2022)

TANNERIES ARE RECOVERING, BUT CAUTION IS NEEDED



President Fabrizio Nuti analyses the complex context of the sector at the UNIC Assembly



Caution is necessary. The need to promote the excellence of Italian leather. The value of the district model. These are the three cornerstones around which on 14 December 2021, in Milan, the Annual Assembly of UNIC – Italian Tanneries took place, which is the most important global association in the tanning sector (member of Confindustria and Confindustria Moda) representing about 1,200 companies, 17,500 employees and directing 75% of its annual production to exports.

Caution is necessary

“The still ongoing health emergency requires the utmost caution”. ~ Fabrizio Nuti, president of UNIC

These are the words of Fabrizio Nuti, president of UNIC at the turning point in the first year of his mandate. A caution that the progression of sector data considers necessary. “We left each other at the end of 2019 with some declining indicators: turnover -6%, production -9%, exports -8%. Between February-March 2020, violent and completely unexpected, the pandemic hit us “and, at the end of last year” we recorded significant drops in terms of turnover (-23%), production (-16%) and exports (-25%)”. Then, 2021 arrived, which is coming to an end and “was characterised by supply difficulties and the increase, even in double digits, of leather and chemical products, of energy costs that are pushing inflation”. A particularly complex economic context, in which “at the end of the year margin losses must be avoided” and which expresses a “turnover at +23%, exports +25%, production +13%, with widespread (and often double-digit) increases in all the main districts and on almost all production segments by type of animal and intended use. On this last point it is worth noting the important recovery of leathers for the furniture sector occurred in the last two years, after more than 10 years of constant downsizing”. In conclusion, the values ??remain between 5 and 20%, below pre-pandemic production and turnover levels, “but we hope that 2022 will reveal a return to almost complete normality”.

Promoting the excellence of Italian leather

“It is important to let everyone know that what has been done in Italy in terms of investments searching for completely circular sustainability – says Nuti – has not been done anywhere else in the world. This is a fact and it is not up for debate”. However,

“the presence of foreign entities less attentive to social, safety and environmental problems ends up damaging the image of the entire sector”. We therefore need to strengthen the “cultural, educational, social work” that UNIC has been carrying out for years “by intensifying the communication activity towards key stakeholders”. In fact, “the demand for new and increasingly valid sustainability claims by fashion or design ends up fueling unscrupulous marketing and inflating disproportionate media attention”. The reference is to all “innovative, bio-based or whatever they like being called” materials that continue to appear on the market placing themselves “in open competition with leather. There is certainly room in consumption for diversified choices and the tanning industry has no problem with competing. But it is undeniable that these competitors conquer greater spaces in the media, basing their strategy on the constant denigration of tanning, leather and on the assumption of an alleged superiority in terms of sustainability and performance: a superiority that to date has never been supported by facts”. Indeed, a research “by the German FILK Institute has put 8 of these new products under the microscope, documenting how their technical performances have little or nothing in common with those of our material”. Not just that: “The same study revealed that the much claimed sustainability of these materials is seriously compromised by the need to use massive doses of synthetic components”. Hence, only leather is better than leather. It seems like a wordplay, but it is the absolute truth.

The value of the district model

According to Nuti, the district model is the winning matrix of the Italian tannery to be defended and enhanced: “Our production reality has always based its value on a territorial system that feeds it and in turn is nourished by it. We cannot fail to recognise that the development and success of us small and medium-sized enterprises is due to the districts and their systematisation of the Italian tanning model, that remains unique in the world. They have been a strategic place for the development of environmental policies: we have innovated products and processes, energy savings, raw materials, reduction of scraps and waste and recycling”. It is therefore necessary to “enhance what exists, bringing together the skills of everyone, promoting improvement and dialogue with institutions to make choices that go towards the ecological transition, proposing and stimulating training and information courses”. Because even though it is possible to race alone, you win together, thanks to the awareness that “the Italian tanning industry system is unique”, concludes the president of UNIC.

(Tannerymagazine.com – 26/12/2021)

GOVT APPROVED INDIAN FOOTWEAR, LEATHER DEVELOPMENT PROGRAMME FOR CONTINUATION - DPITT



The commerce and industry ministry on Saturday said Indian Footwear and Leather Development Programme (IFLDP) has been approved for continuation with a financial outlay of Rs 1,700 crore. IFLDP has been approved by the cabinet on January 19 for continuation till March 31, 2026, or till further review, whichever is earlier, it said in a statement. The programme aims at development of infrastructure for the leather sector, address environmental concerns specific to the leather sector, facilitate additional investments, employment generation and increase in production.

Sub-schemes approved under the programme include sustainable technology and environmental promotion; integrated development of leather sector (IDLS); establishment of institutional facilities; Mega Leather Footwear and Accessories Cluster Development; brand promotion; and development of design studios. It added that development of design studios (proposed outlay Rs 100 crore) is a new sub-scheme and it would promote marketing/export linkages, facilitate buyer- seller meets, display designs to international buyers and work as interface for the trade fairs.

Under the IDLS, with a proposed outlay Rs 500 crore, assistance would be provided to the sectoral units for their modernization/ capacity expansion/technology up-gradation on or after January 1, 2020. It added that under brand promotion, the government would provide 50 per cent assistance of total project cost subject to a limit of Rs 10 crore for each brand in the next three years to promote ten Indian brands in the international market. The designated agency to implement the sub-scheme is being proposed to be selected amongst institutes like NID, NIFT, IBEF, IIFT or institutes of similar standing,” it said.

(Financial Express - 05/02/2022)

Path Breaking Discoveries in Biology

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The birth of biology: 5th - 4th century BC

The Greek philosophers, voracious in their curiosity, look with interest at the range of living creatures, from the humblest plant to man himself. A Greek name is coined by a German naturalist in the early 19th century for this study of all physical aspects of natural life - biology, from *bios* (life) and *logos* (word or discourse). It is a subject with clear subdivisions, such as botany, zoology or anatomy. But all are concerned with living organisms.

The first man to make a significant contribution in biology is Alcmaeon, living in **Crotona** in the 5th century. Crotona is famous at the time for its Pythagorean scholars, but Alcmaeon seems not to have been of their school.

Alcmaeon is the first scientist known to have practised dissection in his researches. His aim is not anatomical, for his interest lies in trying to find the whereabouts of human intelligence. But in the course of his researches he makes the first scientific discoveries in the field of anatomy.

The subsequent Greek theory, subscribed to even by **Aristotle**, is that the heart is the seat of intelligence. Alcmaeon reasons that since a blow to the head can affect the mind, in concussion, this must be where reason lies. In dissecting corpses to pursue this idea, he observes passages linking the brain with the eyes (the optic nerves) and the back of the mouth with the ears (Eustachian tubes).

Aristotle may be wrong about the brain being in the heart, but in general he gives a far more complete and well observed account of biology than any other Greek philosopher.

He inaugurates scientific zoology in his reliance on careful observation. He is particularly acute in his study of marine life, having much to say on the habits of fishes, the development of the octopus family, and the nature of whales, dolphins and porpoises. He is also a pioneer in attempting a system of **classification**. Observing an unbroken chain of gradual developments, as the life of plants shades into that of animals, he acknowledges the complexity of the subject and seems almost to glimpse the pattern of evolution.

Aristotle's notes on botany are lost, but many of his observations no doubt survive in the earliest known botanical text - nine books *On the History of Plants* written by Aristotle's favourite pupil, **Theophrastus**.

Writing in about 300 BC, Theophrastus attempts to classify plants, as well as describing their structure, habits and uses. His remarks are based on observations carried out in Greece, but he also includes information brought back from the new **Hellenistic** empire in the Middle East, Persia and **India**, resulting from the conquests of Alexander the Great.

The influential errors of Galen: 2nd century AD

The newly appointed chief physician to the gladiators in Pergamum, in AD 158, is a native of the city. He is a Greek doctor by the name of Galen. The appointment gives him the opportunity to study wounds of all kinds. His knowledge of muscles enables him to warn his patients of the likely outcome of certain operations - a wise precaution recommended in Galen's **Advice to doctors**.

But it is Galen's dissection of apes and pigs which give him the detailed information for his medical tracts on the organs of the

body. Nearly 100 of these tracts survive. They become the basis of Galen's great reputation in medieval medicine, unchallenged until the anatomical work of **Vesalius**.

Through his experiments Galen is able to overturn many long-held beliefs, such as the theory (first proposed by the Hippocratic school in about 400 BC, and maintained even by the physicians of **Alexandria**) that the arteries contain air - carrying it to all parts of the body from the heart and the lungs. This belief is based originally on the arteries of dead animals, which appear to be empty.

Galen is able to demonstrate that living arteries contain blood. His error, which will become the established medical orthodoxy for centuries, is to assume that the blood goes back and forth from the heart in an ebb-and-flow motion. This theory holds sway in medical circles until the time of **Harvey**.

In the profoundly Christian centuries of the European Middle Ages the prevailing mood is not conducive to scientific enquiry. God knows best, and so He should - since He created everything. Where practical knowledge is required, there are ancient authorities whose conclusions are accepted without question - **Ptolemy** in the field of astronomy, **Galen** on matters anatomical.

A few untypical scholars show an interest in scientific research. The 13th-century Franciscan friar Roger Bacon is the most often quoted example, but his studies include alchemy and astrology as well as optics and astronomy. The practical scepticism required for science must await the Renaissance

Leonardo's anatomical drawings: 1489-1515

In about 1489 Leonardo da Vinci begins a series of anatomical drawings. For accuracy of observation they are far in advance of anything previously attempted. Over the next twenty-five years he dissects about thirty human corpses, many of them at a mortuary in Rome - until in 1515 the pope, Leo X, orders him to stop.

His drawings, amounting to some 750, include studies of bone structures, muscles, internal organs, the brain and even the position of the foetus in the womb. His studies of the heart

suggest that he was on the verge of discovering the concept of the **circulation of the blood**.

Illustrated books: 16th century

It is a coincidence of great value to biology, in which observation is of prime importance, that the **Renaissance** revival of interest in science coincides with the invention of printing. As soon as books can be published with **woodcut** illustrations set among printed text, naturalists have not only a large new readership but also the ability to show what they have so carefully observed.

The first to make serious use of this opportunity is a botanist, Otto Brunfels, whose three-volume *Herbarum vivae eicones* (Living images of plants) is published in Strasbourg between 1530 and 1540.

Brunfels' pioneering example is soon improved upon by another German botanist, Leonhard Fuchs, whose *Historia Stirpium* (History of plants) is published in Basel in 1542. Fuchs introduces a new accuracy, in his depiction and his verbal description of the plants.

A French naturalist of this period provides a good example of the **Renaissance** impulse to match and perhaps even outdo the classical authors. In 1546 Pierre Belon sets off on a two-year tour of lands round the eastern Mediterranean with the specific purpose of finding and depicting animals and plants described by ancient writers.

Belon's travels and observations are recounted in a succession of illustrated volumes published in Paris during the 1550s - on fishes and dolphins (1551), on conifers (1553), on general Middle Eastern curiosities (1555), on birds (1555) and finally 'portraits of birds, animals, snakes, herbs, trees, men and women of Arabia and Egypt, together with a map of Mount Athos and of Mount Sinai for the better understanding of their religion' (1557).

Belon is an unashamed generalist. Meanwhile a highly specialized volume, the most significant of all the early illustrated scientific works, has been published in Basel in 1543 - bringing to a wide public the discoveries of Vesalius.

Vesalius and the science of anatomy: 1533-1543

A young medical student, born in Brussels and known to history as Vesalius, attends anatomy lectures in the university of Paris. The lecturer explains human anatomy, as revealed by **Galen** more than 1000 years earlier, while an assistant points to the equivalent details in a dissected corpse. Often the assistant cannot find the organ as described, but invariably the corpse rather than Galen is held to be in error.

Vesalius decides that he will dissect corpses himself and trust to the evidence of what he finds. His approach is highly controversial. But his evident skill leads to his appointment in 1537 as professor of surgery and anatomy at the university of Padua.

In 1540 Vesalius gives a public demonstration of the inaccuracies of **Galen's** anatomical theories, which are still the orthodoxy of the medical profession.

Galen did many of his experiments on apes. Vesalius now has on display - for comparison - the skeletons of a human being and of an ape.

Vesalius is able to show that in many cases **Galen's** observations are indeed correct for the ape, but bear little relation to the man. Clearly what is needed is a new account of human anatomy.

Vesalius sets himself the task of providing it, illustrated in a series of dissections and drawings. He has at his disposal a method, relatively new in Europe, of ensuring accurate distribution of an image in printed form - the art of the **woodcut**. His studies inaugurate the modern science of anatomy.

At Basel, in Switzerland, Vesalius publishes in 1543 his great work - *De humani corporis fabrica* (The Structure of the Human Body). There are seven volumes including numerous magnificent **woodcut illustrations**. The book is an immediate success, though naturally it enrages the traditionalists who follow **Galen**. Galen's theories have, after all, the clear merit of seniority. They are by now some 1400 years old.

But for those willing to look with clear eyes, the plates in Vesalius's volumes are a revelation. For the first time human beings can peer beneath their own skins, in these strikingly clear images of what lies hidden.

Attempts at classification: 1583-1704

It is a natural impulse for any academic, confronted by the bewildering array of nature's living forms, to try and establish some degree of order. One of the first to make a successful attempt is Andrea Cesalpino, whose *De Plantis* of 1583 classifies plants according to the characteristics of their flowers, seeds and fruits.

The Swiss physician and botanist Gaspard Bauhin extends Cesalpino's work in two books (*Phytopinax* 1596, *Pinax theatri botanici* 1623). Both titles mean 'gallery of plants', and Bauhin classifies some 6000 examples. The main significance of his work is that he is the first to arrange plants in separate groups, or genera.

Bauhin's work was the beginning of the binomial (two-name) system which subsequently prevailed in the classification of living organisms. Each is placed in a category, and the classification combines the name of the category with that of the wider group of which the organism is considered to be a member.

These two levels of classification eventually become standardized as the genus and the species. A basic problem of classification within this arrangement is to decide how much apparent variation can be allowed to plants or animals grouped as a single species. This is resolved in the work of the English naturalist John Ray, who makes extensive tours in Europe during the 1660s with his patron Francis Willughby. Their express purpose is to classify all plants and animals.

Ray publishes classifications of birds (1676), plants (from 1682), fishes (1686), land animals (1693) and insects (1705). In their original partnership the plan was for Willughby to undertake the animals and Ray the plants. Willughby dies young, in 1672, and Ray credits him with the text on birds and fishes (though amplifying it himself).

The greatest achievement is Ray's own work on botany. The *Historia Plantarum* (1686-1704) describes some 18,600 plants, categorizing them in ways which hold good today. His most influential decision is defining a species as a group which has a mutual fertility, each member capable of reproducing with any other. Ray's efforts prepare the way for Linnaeus.

Harvey and the circulation of the blood: 1628

A book is published in 1628 which provides one of the greatest breakthroughs in the understanding of the human body - indeed perhaps the greatest until the discovery of the structure of DNA in the 20th century.

The book consists of just fifty-two tightly argued pages. Its text is in Latin. Its title is *Exercitatio anatomica de motu cordis et sanguinis in animalibus* ('The Anatomical Function of the Movement of the Heart and the Blood in Animals'). Its author is William Harvey. In this book he demonstrates beyond any reasonable doubt an entirely new concept. Blood, he shows, does not drift in the body in any sort of random ebb and flow. Instead it is pumped endlessly round a very precise circuit.

Until now it has been assumed that the blood in arteries and the blood in veins are different in kind. It is well known that they are of a different colour, and there have been many theories as to what each supply of blood does.

The most commonly held belief is that arterial blood carries some sort of energy connected with air to the body (not far from the truth), and that blood in the veins distributes food from the liver (less accurate).

By a long series of dissections (from dogs and pigs down to slugs and oysters), and by a process of logical argument, Harvey is able to prove that the body contains only a single supply of blood; and that the heart is a muscle pumping it round a circuit.

This circuit, as he can demonstrate, brings the blood up from the veins into the right ventricle of the heart; sends it from there through the lungs to the left ventricle of the heart; and then distributes it through the arteries back to the various regions of the body.

After much initial opposition, Harvey's argument eventually convinces most of his contemporaries. But there are two missing ingredients. His theory implies that there must be a network of tiny blood vessels bringing the blood from the arterial system to the venous system and completing the circuit. But his dissections are not adequate to demonstrate this. It is not till four years after his death that Marcello Malpighi observes the capillaries.

And Harvey is unable to explain why the heart should circulate the blood. That explanation will have to await the discovery of **oxygen**.

Malpighi and the microscope: 1661

Marcello Malpighi, a lecturer in theoretical medicine at the university of Bologna, has been pioneering the use of the **microscope** in biology.

One evening in 1661, on a hill near Bologna, he uses the setting sun as his light source, shining it into his lens through a thin prepared section of a frog's lung. In the enlarged image it is clear that the blood is all contained within little tubes.

Malpighi thus becomes the first scientist to observe the capillaries, the tiny blood vessels in which blood circulates through flesh. They are so fine, and so numerous, that each of our bodies contains more than 100,000 kilometres of these microscopic ducts.

With their discovery, the missing link in Harvey's **circulation of the blood** has been found. For the capillaries are literally the link through which oxygen-rich blood from the arteries first delivers its energy to the cells of the body and then finds its way back to the veins to be returned to the heart.

Malpighi's pioneering work with the **microscope** is taken further by the Dutch researcher Anton van Leeuwenhoek. Teaching himself to grind lenses to a very high degree of accuracy and clarity (some of them providing a magnification of 300x), he uses a simple microscope with a single lens - in effect a tiny and extremely powerful magnifying glass.

With instruments of this kind he is able to observe phenomena previously too small to be seen. In 1674 he is the first scientist to give an accurate description of red blood corpuscles. In 1677 he observes and depicts spermatozoa in the semen of a dog. In 1683 he provides a drawing of animalculae (or bacteria) seen in saliva and dental plaque.

His discoveries, published for the most part in the *Philosophical Transactions* of the **Royal Society** in London (though he himself lives in Delft), vividly suggest the excitement of being the first to wander with such enlarged vision among the minutiae of the animal kingdom.

His account of the common flea follows its development from egg to the practical perfection of its adult anatomy. His researches demonstrate for the first time that the tiniest living things have a life cycle and generative systems like any larger creature.

The Swedish botanist Carl von Linné, or in the Latin version of his name Linnaeus, is an obsessive classifier. Outside his own field of natural history he tries his hand at organizing a system of minerals and even of diseases. But his fame derives from his having finally put in place, at the end of an experimental period lasting nearly two centuries, the method of classification in the plant and animal kingdoms which still prevails today.

In 1735 Linnaeus publishes *Systema naturae* (System of nature), in which he proposes a system capable of classifying all living things. It is based on the twin categories genus and species, pioneered by **Bauhin** and developed by John **Ray**.

Linnaeus begins his task by defining the genera into which the species of plants will be divided (*Genera plantarum* 1737). Next, over a much longer period, he assigns some 6000 species of plants to their appropriate genera (*Species plantarum* 1753). He follows this with an updated edition of the *Genera* in 1754.

Linnaeus' criterion for grouping plants, by the number of their stamens and pistils, has proved misleading and has been revised. But his version of the **Binomial system** survives intact, applying to animals as effectively as to plants. He proposes the use of genus and species to classify animals in the tenth edition of *Systema naturae* (1758), listing 4236 species as a preliminary contribution.

Cuvier and paleontology: 1812

William Smith in the late 18th century has used the evidence of fossils in rock strata for the advancement of geology. Georges Cuvier studies the fossils for their own sake, and in doing so founds the science of palaeontology.

His researches concentrate on the fossils of mammals and reptiles found in rocks in the Paris region, with special emphasis on extinct mammals of the **tertiary period**. His results are published in 1812 in the four volumes of *Recherches sur les ossements fossiles des quadrupeds* (Researchs on the fossil bones of quadrupeds).

The discoveries revealed in this pioneering work provide the basis for subsequent theories of evolution, though they do not suggest that explanation to Cuvier himself. Confronted by the remains of extinct species, he concludes that the earth has gone through a series of cycles (which he calls 'revolutions'), corresponding to the observable **Geological periods**.

Each revolution, he believes, ends in some catastrophe of nature which destroys most of the existing fauna and flora. The survivors are joined by fresh species resulting from a new bout of creation. Subsequent researches by others, unearthing transitional fossils, give weight to the argument for a more gradual or evolutionary process.

Read and Let Read :-

JILTA

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The Economics of the Raw Materials used and Improved Techniques for the manufacture of Brown Picking Bands

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The combination Sulphur, Oil and Vegetable Tanned picking band is popularly known as double oak Tanned or brown picking band in the market.

RAW MATERIALS

(Availability, Grading, Statistics, Economic Implications of flay cuts and Improvements).

In India Buffalo Hides are the only suitable indigenous raw material available. Imported ox-hides from North of Italy and South of Germany are famous for their use in the manufacture of Belting and Picking Bands.

Being the chief source of milk in our country, buffaloes are the best fed of all the Indian live-stocks. Hence the hides derived are the best raw materials in India. The latest production figures for buffalo hides are not available, the figures available from the Report on Marketing of Hides, Second Edition being for the year 1948. Today due to restriction on the slaughter the figures will not exceed the ones discussed below.

Madras, Madhya Pradesh, Uttar Pradesh, Bombay and Bihar account for nearly $\frac{2}{3}$ th of the total production of buffalo hides. In total we produce about 48 lakhs Buffalo hides annually out of which 12% or a little less than 6 lakhs are slaughtered hides. The slaughtered hides come mainly from Madras, West Bengal, Uttar Pradesh, Bihar, Bombay, Travancore-Cochin and Mysore States. The slaughtered buffalo production for the rest of our country is negligible.

The slaughter is done for beef but due to restriction on the number of heads to be killed per slaughter house, only the heaviest animals are killed to get more beef. Exact statistical data regarding the production of Buffalo for different weight ranges is not available but it may be roughly divided as follows as per green slaughtered weights :—

Below 50 lbs. Green	..	..	1½ lakhs
50 lbs. to 60 lbs.	..	..	1 lakh
60 lbs. to 70 lbs.	..	..	1 "
70 lbs. to 80 lbs.	..	..	1 "
Suitable for Picking Bands : 80 lbs. to 90 lbs.	..	..	1 "
" " Pickers : Above 90 lbs.	..	..	$\frac{1}{2}$ "
Total annual production	..	..	6 lakhs

Hides upto 75 lbs. Green Wt. are totally uneconomical for making picking bands due to thinness. The hides in weight range 75 to 80 lbs. may be suitable

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for picking bands provided there is improvement in the take off. The hides above 90 lbs. are always bought by the picker manufacturer who requires the heaviest stuff and is in a position today to offer the best prices in the market. This leaves only 1 lakh hides to the picking bands manufacturer annually and from this he has to select hides free from any brand marks and deep flay cuts and holes. This is surely far from satisfactory and people to whom it may seem we are self sufficient in buff hides are not so correct.

Buff hides are good raw material for picking bands. Even after conceding to the fact that they have a loose structure as compared with the imported ox hides, the latter are twice as costly as buffs. Another fact is that our buffaloes are almost free from warbles whereas 50% of the imported ox are sometimes full of warbles, and this has a direct effect on the life of a picking band. The hides are much more free from any grain defects and give a good substance.

Flay Cuts: The major drawback seems to be the poor take off and this needs a lot of improvement. The hides from weight range 75 to 80 lbs. can easily be brought for use in picking bands, provided there are no cuts. Flay cut is a continuous headache and accounts for most of the higher cost of production. Picking bands have to be completely free from cuts and only due to cuts about 33% of cut lengths in the production get little or no price. The cost of these picking bands are naturally borne by the full lengths and hence this leaves only little price difference with the imported quality.

Imported ox-hides being from the best fed and treated animals give a naturally close texture of even substance and even at the backbone they give a thickness of 6 mm. The wastage in this case is almost nil. Only 5% cut length are got from these hides and that too from the borders due to irregular shape which is unavoidable. The imported ox-hides also give more yield due to regular shape and thickness. The final picking band is 20% more durable than buff one and therefore finds more demand in the market even with a price difference of (Re. 1/- to Rs. 2/- per lb.) 15% to 30%. As long as the flay cuts exist there will be a demand for import of ox-hides.

Another very important observation regarding flay cuts is that they are more in number for lighter raw material and same in depth for all weight ranges. This is why only hides above 80 lbs green are suitable for picking bands as most of the cuts can be eliminated during the shaving operation. Hides from weight ranges 75 to 80 lbs., though being most suitable for picking bands are useless due to cuts which cannot be eliminated in shaving. If we can get rid of the cuts completely we can make available about $\frac{1}{2}$ lakh hides annually for sufficiency in our raw material for picking bands. Also there will not be more than 5% cut lengths and thus the final price difference in picking bands with imported material will be in favour of indigenous picking bands.

Improvements: The report of the F.A.O. of U.N. on the "Flaying and Curing of Hides and Skins as a Rural Industry" is an extensive study on the subject. The different recommendations in the publications must be immediately and vigorously adopted in our country. The method of flaying hides with compressed

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air oscillating machine can be very easily adopted at least in India's big slaughter houses. The blowing in air method described for flaying skins is also very interesting and can be adopted even in our villages. The simple methods described for hoisting the animal can also be adopted in our villages. As long as we cannot get rid of the flay cuts we will never be able to firmly stop the import of ox-hides.

Bellies & Offal: One more problem with the indigenous raw hides is the disposal of offal. Unfortunately in India there are no tanneries, who do only the offal tannage. In foreign countries where there are a number of tanneries doing only offal tannage, it is possible for the raw hide dealer to sell the hides into butts and offal separately. The Indian tanner has to buy whole hides and has to either sell the cuttings in raw or tan it by himself. Tanning of this type is not possible unless the picking band man is also a sole leather tanner and this means a lot of investment. A small unit can only sell the bellies for whatever price it gets and buyer usually obliges in offering some prices.

We hope that as the time marches and with the steady industrialisation there will be more and more demand for picking bands. Assured with a regular supply of offal some people are likely to take interest in the tanning of the offal.

TANNING AND TREATMENT MATERIALS

(1) *Quebracho Extract:* Quebracho is the indispensable item required in the manufacture of this type of leather. The tanning content of Quebracho Extract is upto 80% which is not available in any other extract in the world. The molecular weight of tannin in Quebracho is also the highest. It is this high molecular weight of quebracho tannin which gives leather the property of holding and retaining the maximum amount of greases. The life of a picking band depends on the amount of greases it is able to retain after continuous working. The longer the grease is retained the longer will be the lubrication and thus the lesser distortion of the fibres due to continuous twisting and abrasion during working. This gives the combination tanned picking band the longest life. It is the tensile strength coupled with the maximum retainable lubrication property rather than the tensile strength only, that decides the life a picking band.

In Western countries attempts have been made to replace quebracho with substitutes from Chestnut Extract, but not with much success. India with a very limited source of vegetable tanning materials is unable to substitute wattle extract with indigenous tanning material and I think it will not be possible for her to find a natural substitute for quebracho. Only possible substitute India should explore is some synthetic tanning agent, with a very high molecular weight. In view of this attempts were made by the author to tan some oil tanned pieces with synthetic tanning agents of heavier molecular weight, alone and along with quebracho extract.

The samples tanned alone with syntans did not show any difference with the oil tanned leather and I somehow feel that the synthetic tannins do not easily combine with the oil tanned leather and some type of foreign agent is necessary or in extreme case, it may be that syntan have very little or no affinity for oil

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tanned leather. Probably the oil tannage satisfies the groups with which syntans would have combined, and still some active groups are left with which only vegetable tannins can combine feebly. Vegetable tannins with a natural affinity for fats may also be forming bonds with the fats which have been firmly fixed on leather and the final vegetable tannage may not be taking actual part in the tanning of the fibres.

The combination quebracho and synthetic tanned samples gave an emptier leather. Moreover the cost of the synthetic tannins of the specially high molecular weight made its use prohibitive.

Gambier : Gambier is the best but the costliest Tanning material and a well known luxurious tanning material. In spite of its cost, this extract is even now used by certain tanneries making strap leathers. Telephone and Electrical workers who work on tall buildings and skyscrapers as in U.S.A. use straps their life depends on the strap and the cost of the straps therefore is a secondary question.

Substitutes for Gambier are possible by blending and treating natural vegetable tanning material like wattle. We should explore the possibility of making similar substitutes from Babul or Konnam Extract, preferably by blending with myrab and sulphiting.

Fish Oil : This is the third important material for the manufacture of combination picking bands. Pure fish oil of iodine value above 150 only is useful. The higher the iodine value the better will it combine with the hide fibre, and longer will be the life of the picking band.

The chief source of this fish oil of iodine value above 150 is the Sardine fish available on the Western Coast from Goa to Cochin. The availability of this variety of fish is seasonal and so uncertain that the oil may be available from Rs. 0.25 to Rs. 1.20 per lb. Sometimes the fish is caught on this coast abundantly and then for three or four years it completely disappears from this coast. A recent bulletin published by the C.L.R.I. is a very useful survey on this industry. Looking to the huge catches of Sardine on our coast one wonders why our fisheries departments could not set up scientific plants for extraction of this oil. Apart from the growing local demand there is a shortage of this oil in the Western Countries and we can earn very precious dollars for our five year plans. The catches of the fish also can be increased by improved methods of fishing and some scientific restrictions on fishing. The tanner will also be assured of some regular and reliable source of fish oil which will give him the necessary iodine value. The present extraction of oil of this variety is done in a very crude way and the quality therefore is full of stearins, dirt, thorns and water.

Centrifuging this oil with the conical discus centrifuge separates the dirt, water and stearins simultaneously and gives a clear filtered oil which is much more useful and pure. The iodine value also increases to some extent. If the clear oil is further treated with activated carbon or china clay and stirred vigorously at about 200°F and then again filtered, the resultant oil will be paler in colour and will have a pleasant fishy smell. The final colour of the leather is decided

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more by the colour of the oil than by the colour of the final vegetable tannage. Thinner the fish oil better will be the lubrication and thus better will be the picking band.

Tallow: Plenty of beef tallow is available in our country but only of late due to restriction on imports of Australian mutton tallow more and more industries like soap and textile are turning to the indigenous supply. The Indian beef tallow is therefore becoming costlier day by day. A time may come when the Indian prices will equal to the imported mutton tallow. As far as the quality of our indigenous tallow is concerned, it is quite upto the standard provided one pays for the quality. But now-a-days due to restriction of imports there is a tendency to mix some "Murder" or dead tallow in the supply.

TECHNIQUE AND METHOD OF MANUFACTURE

Not much literature is available on the manufacture of this type of picking bands and the process is even now kept a secret by the French manufacturers who have specialised in this item. An attempt is therefore made to discuss the process in detail with the necessary points that can be explored by our research workers.

Raw Materials: Slaughtered buffalo hides from wet salted weight range 65 to 85 lbs. are the most suitable raw material. Ox croupions from weight range 40 to 45 kilos (whole hides) wet salted from North of Italy are the best raw material.

While buying the buffalo hides care should be taken to select only the hides from young animals, of good substance, free from cuts and brand marks. Minor grain defects are permissible. It is best to have a sole leather tannery side by side when it is possible to select hides in the liming stage. Only wet salted hides are useful. Green slaughtered hides should be salted and aged for sometime in the tannery before taking them for further processing. The hides are rounded in raw into butts and bellies and shoulders. The butts are rounded upto maximum 60" in length as the picking bands are cut only neck to tail wise and are sold in the lengths of about 60". Only butts are taken up for picking bands.

Soaking: The butts are soaked in plain water in a tank and an addition of about 8 ozs. of bleaching powder per 100 galls. of soak is made as a preservative. An addition of about the same quantity of a synthetic detergent also helps. The butts are soaked for 3 to 4 hours and washed and drained for about 15 minutes.

Shorter the liming better will be the life of picking band. It is due to this reason that many people are in favour of complete elimination of this process and do the tanning with hair on. This is possible only with ox-hides in which case the long hairs of the imported ox have to be clipped as they hinder the penetration of fats, etc., during further process. The hairy hides are preferably fleshed in raw and then soaked in an acid salt soak to firm up the hair. An addition of little alum recommended for this reason. After proper soaking the hides go directly for the pickling process.

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THE ECONOMICS OF RAW MATERIALS FOR BROWN PICKING BANDS

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Limings : Unfortunately for buffalo hides have a very harsh hair and an unpleasant look and colour and liming therefore becomes necessary. The liming if properly done will not affect the life of the picking band much.

There are three different ways of liming :

- (1) Paddle liming.
- (2) Painting.
- (3) Pit liming.

(1) *Paddle Liming* : This is the best and the quickest way of liming. The following recipe is recommended :

- 2.5% Sodium Sulphide.
- 20% Lime.
- 400% Water.

The more the amount of lime more will be the loss in hide substance, and therefore lesser will be the life of picking band. Lime has got a more drastic action on the epidermis. The hides are entered in the paddle and the paddle is run for 15 minutes and rested for 45 minutes. The liming should be complete within 4 to 6 hrs. The period of liming should be so adjusted that the hair just start coming out. Excess of paddling will reduce the life of picking bands. While starting the paddle the hides are given an outside motion with a stick etc. as the butts will take much time to come into motion especially when they become plumped and heavy. If this is not done the hides on the top may get damaged due to continuous beating of the paddle.

After correct liming the hides are scudded and fleshed and again scudded. The hides are then piled to drain for 15 minutes and weighed, this weight is the limed pelt weight of the butts and the further quantities of material are based on this weight. The liming is so started that the hides come for deliming in the evening.

(2) *Painting* : This is the second suitable method of liming, but is more useful for ox-hides. The buffaloes have more deeply rooted hair and it is very difficult to remove the hair completely even with the most perfect painting.

The paint is made as follows :—

- 50 lbs. Shell Lime.
- 12 lbs. Sodium Sulphide.
- 80 lbs. Water.

This is sufficient for about 20 to 25 butts. It is also preferable to replace some of the amount of lime in the paint with clays, to avoid loss of hide substance by lime. Some people also use old lime liquor instead of water to quicken the unhairing.

The paint is aged for 24 to 48 hrs. before use. The necessary amount of water is added if necessary and the whole thing is stirred to make a viscous mass.

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The soaked hides are dipped one by one and piled in a heap of 25 hides. Care should be taken to lift the hides properly and pile without scraping the ground so that the paint remains on the hides. The painting is completed by evening and the goods are left in the pile overnight well covered with gunnies. For ox-hides *it should be possible to unhair in the morning very easily. This is due to two reasons. The longer and more hair on the ox-hides carry more paint than buffalo hides, and secondly because the ox-hair are less deeply rooted than the buffalo hair. The buffalo hides will have to be painted for a second time during the night 4 to 5 hrs., after the first painting, so that they come for unhairing on the next day morning.*

Care should be taken to drain the hides properly after soaking as otherwise no paint will stick on to the hides.

(3) *Pit Liming* : This method is suggested only to people who have a serious objection to work in strong sulphide liquor. The method is lengthy and much hide substance is lost, resulting in an inferior quality of leather. The hides after soaking are immersed in a lime pit containing :

1	to 1½%	Sodium Sulphide.
10%		Lime.
400%		Water.

The liquor is prepared on the previous day of its use. The hides are entered in the liquor and handled twice daily. The liquor is well stirred before putting back the butts in the liquor. On the 4th day the hides are unhaired, fleshed and scudded and weighed after complete draining for 15 minutes.

Drum liming is also possible for this type of leather but special type of drum without pegs and with cross paddles inside is required. The period of liming and the quantities are done on the same lines as paddle liming.

It is best to remember that any mechanical action should be avoided during the entire process, as far as possible.

Deliming : The hides after liming are in a most delicate physical condition and any mechanical action like drumming in the limed stage should be avoided as it will distort and break up the fibres and fibre bundles resulting in a poorer strength. The deliming is, therefore, carried as follows :—

The hides are given one plain wash for 15 minutes in 400% water and drained.

150% water and 2% Ammonium sulphate and ½% Sodium Bisulphite is added to the drum and run for 10 minutes. The goods are then well pressed below the surface of the float and left in the drum overnight.

Next day the drum is run for 10 minutes and the goods tested with phenolphthalein. Complete deliming is effected evenly by this process and the hides undergo a sort of bating action.

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After complete deliming the goods are given a thorough scudding. This scudding is very important in case of buffalo hides due to deeply rooted hair. The hides are then washed briskly in two changes of water, drained and taken up for pickling.

Pickling : A comparatively heavy pickle is given to deposit maximum sulphur in the subsequent depickling with Hypo. 10% salt and 80% water are dissolved and added to the drum. The drum is run for 15 minutes in the salt solution.

2% salt is dissolved and made to 80°Bk in a tub separately and 2½% Sulphuric acid or 4½% Hydrochloric acid is given in four equal instalments. Each instalment of acid is added to the drum at the interval of 20 minutes after diluting each instalment with the 80°Bk salt solution from the tub.

The goods are drummed for 2 to 3 hrs. after the last instalment and left in the pickle overnight. Next day the goods are drummed for 10 minutes and tested with Bromo phenol Blue to get yellow colour throughout (about pH 3). After complete pickling the goods are piled for 24 hours and allowed to drain.

In order to increase the tensile strength of the hides much research needs to be done on the fixation of aluminium on the hides. Aluminium Sulphate can either be given in the pickle or in the depickle bath, along with Sodium Acetate or Citrate. Any fixation of Aluminium also gives a pleasant yellowish colour to the picking bands due to contact with the final vegetable tannins.

Depickling : The hides are drained completely and sammed to some extent. This samming ensures the fixation and deposition of sulphur on the fibres and less into the bath. The bleeding of sulphuric acid into the hypo bath is prevented to some extent.

20 to 22% Hypo is dissolved in 50% water in the drum and the semi sammed hides are thrown into the liquor at once. The drum is started rotating quickly and run for 6 to 8 hrs. The drum is stopped for 10 minutes at the end of every hour to avoid overheating. The goods are left in the liquor overnight. Next day again the goods are drummed for one hour and tested with Bromophenol Blue to get a yellowish green colour (about pH 4 to 4.5).

In order to avoid the immense mechanical action, it is also possible to depickle the butts by spreading hypo in between the butts in a pit. The butts are turned over every day for about six to seven days by which time the depickling is complete. The hypo in this case, should be finely ground as otherwise the impressions left by the big hypo crystals on the hides will be permanent on the final picking band. This is a very expensive process and the depickling may not be as thorough and even as by the drumming. No paddling is possible due to the very little quantity of Hypo bath. If more quantity of water is used as in paddle. The acid in the hides will bleed into bath and there will be precipitation of Sulphur in the bath. The hypo bath cannot be used for subsequent packs.

The hides after depickling are piled to age for 24 hrs. to effect maximum fixation of Sulphur on the fibres.

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Splitting and Shaving: After aging the hides are passed through plain water to remove the excess of salts in the hides, and then sammed in the open. The hides become very thin and depleted, due to the highly hygroscopic nature of hypo and therefore they are dry drummed to open up before splitting. The hides are then split to 4.25 mm. Though the final picking band is about 6 mm. thick the splitting thickness should be far less because of the thickness of the depleted state of hides.

The hides are then shaved to about 3.8 mm. and taken for further processing. Too dry portions are again wet back by sprinkling water and piling.

Oil Tanning: There are two different ways the hides may be processed from this stage.

The first one is by tanning with oil alone. In this case, the hides are put in the hot air stuffing drum and 10 to 12% of good quality Sardine or Cod Oil of good smell and colour, free from foots is given. The temperature of the drum is controlled at 100°F. The oil should have an iodine value of at least 150. Cod oil has better tanning properties than sardine oil. If a properly centrifuged, bleached sardine oil is used it gives about the same results. The hides are drummed for 4 to 6 hours till penetration of the oil is thorough. They are then hung up in a hot room at a temperature of 130°F for 20 days when all the oil is oxidised and the cut edge shows a dark brown colour throughout. After complete drying the hides are washed in plain water with an addition of 1% Synthetic detergent like Teepol and taken for vegetable tanning.

The second method is by stuffing with equal proportion of Tallow and Fish Oil. This method is more preferable because of the following advantages :—

1. More quantity of fats can be incorporated and retained by leather.
2. The resulting leather is full and compact and give a very high angle of weave.
3. The leather is much softer due to the presence of tallow of non-drying nature which combines with the fibres due to the tanning properties of fish oil.
4. There is a very good improvement in the colour of the leather due to the light colour of tallow.
5. There is increase in the yield of upto 30%.
6. All the above properties makes this picking band the most durable product on the loom.

Method: The sammed hides are entered into the hot air stuffing drum and drummed for 10 to 15 minutes to open up. The temperature of the drum is raised to about 120°F and about 10 to 12% of the molten mixture of equal quantities of tallow and fish oil is poured through the hollow axle. The goods are drummed for 4 to 6 hours till the complete absorption of the dubbin. The temperature of the drum is maintained at 120°F throughout.



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The more the iodine value of fish oil the better and more will be the fixation of dubbin on the fibres, resulting in better life for the picking band. It must be remembered that the oil is incorporated in the leather along with an equal quantity of tallow which has little iodine value and no tanning properties. It is only by virtue of fish oil that the tallow is fixed on the fibres.

An addition of about 2% of metallic dryers like manganese linoleate, speeds up the drying. Best results are obtained with dryers based on Chromium or Cobalt by which the drying period is reduced by nearly 40%.

The goods after the 1st Stuffing are dried in a hot room at 130°F. The temperature of the drum is maintained evenly throughout the room. Care should be taken to circulate the air perfectly. Some air from the hot room is gradually replaced with fresh air from outside which will ensure the availability of oxygen in the room. This is very important because some of the oxygen from the room is being used up for the oxidation of oil. The room should be perfectly sealed and heat insulated to prevent leakage of heat. In the long run this will pay because much of the heat that is wasted due to leakage will be saved.

The goods after drying in the hot room for 7 days are again given a second instalment of dubbin with the same quantity and method as the first stuffing. The goods are then allowed to dry in the hot room for 20 to 30 days. Complete oxidation of the fish oil takes place within one month if the temperature of the room is perfectly maintained. The cut edge should show a dark brown colour and a dry feel and look on the fibres. Unoxidised portion will be cream in colour.

Drying of the leather in this condition is a very important factor and any traces of unoxidised oil will retard the subsequent tanning process and the resulting leather. The fats will come out of the hide and the leather will become greasy. The unoxidised parts will show a character more like a vegetable tanned leather and will be more plumped than other parts.

Vegetable Tanning: After complete oxidation of the hides they are given two plain washes with water, and are taken for tanning. 10% quebracho Extract (Sulphited) and 2% Gambier or myrab Extract are dissolved and made to 40°Bk strength. The hides are drummed in this liquor for two days. The drum is stopped for 10 minutes at the end of every hour to avoid overheating. The penetration is complete within two days.

It is possible to do the vegetable tanning in suspenders and handlers. In this case, the hides are directly suspended in 20°Bk liquor and is completed in 40°Bk liquor. This method saves much of the mechanical action in the drumming. The goods generally are tanned through within 10 to 15 days. This method is, however, possible only to sole leather tanners, because the waste liquors from tail suspenders still contain much useful tannins which cannot be used up for any other purpose.

After complete penetration of the hides they are piled in plain water overnight. During this period the loose tannins on the surface get into solution with water and little or no scouring is necessary.

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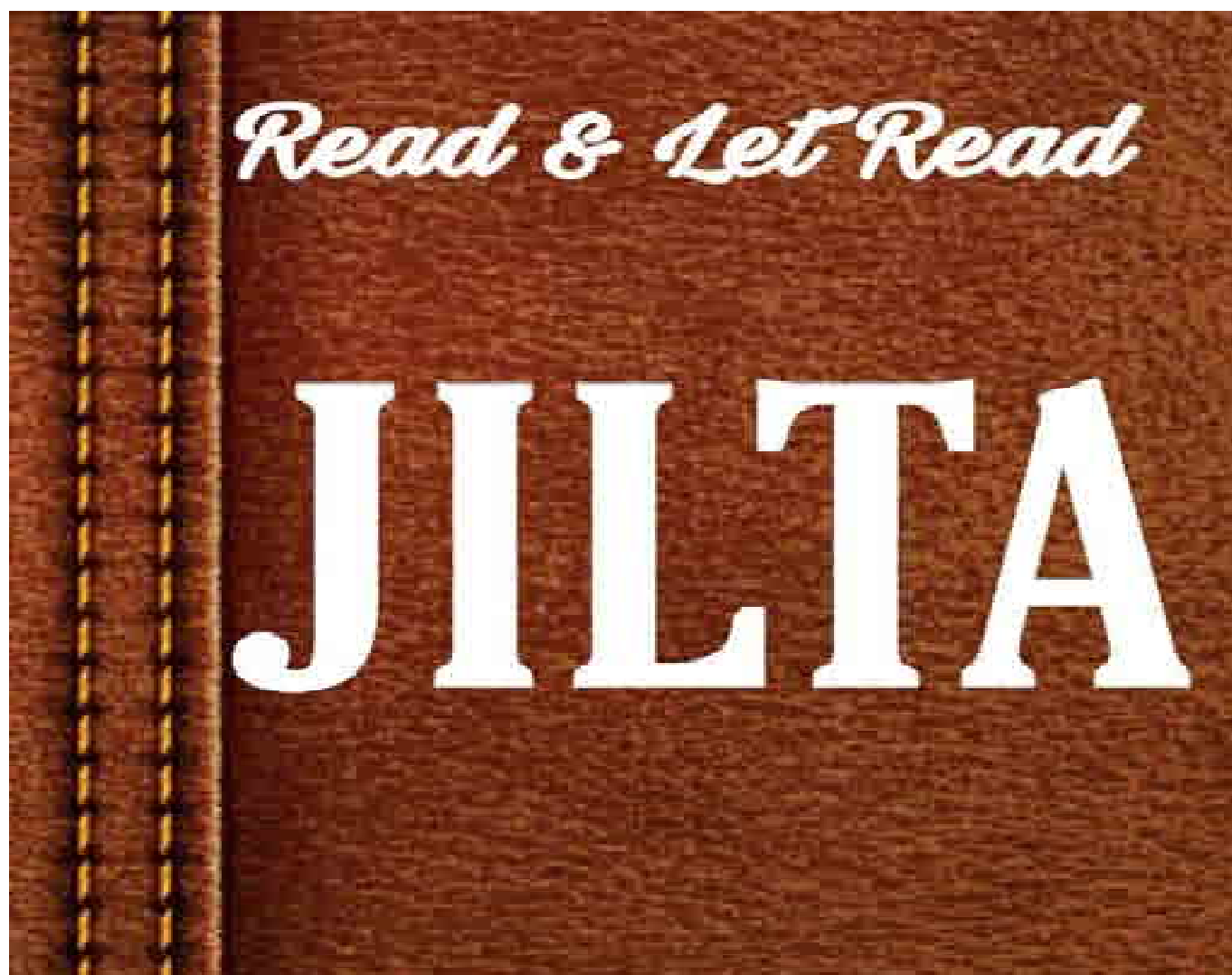
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INDIAN LEATHER TECHNOLOGISTS' ASSOCIATION

Next day the hides are hung up to samm. If the hides are dried in this condition they will give a very dry leather. They are therefore given a third Stuffing with about 5% of the mixture of fish oil and tallow in equal proportion in the stuffing drum. The hides are drummed for 3 to 4 hours at 140°F when all the grease is taken up by the hides.

The hides are hung up in hot room at 140°F for 4 to 5 days, then set well with hand setting machines on tables and piled to age for 15 days to 1 month. Ageing increases the life of the picking bands considerably.

The hides after ageing are shaved to correct thickness, set by hand, and the picking bands are cut as per the size, stretched, trimmed and coiled for packing.



BUDGET 2022: EXPORTERS SEEK SUPPORT MEASURES TO BOOST SHIPMENTS



Exporters have demanded support measures, including enhanced allocations for RoDTEP scheme, high import duty on plastic finished goods, setting up of an Indian shipping line and reinstating exemption for duty free import of critical inputs for leather products, in the forthcoming Budget to promote growth of the country's outbound shipments.

They have also suggested fiscal incentives to address logistics challenges, and reduction of income tax on partnerships and LLP's to support MSME players.

The Federation of Indian Export Organisations (FIEO) said that there is a need to encourage large Indian entities to build an Indian shipping line of global repute as it would help reduce dependence on foreign shipping lines.

It said that the export sector is facing major issues due to rising freight cost and its dependence on global shipping companies.

"Overseas marketing is a big challenge for exporters, more so for MSMEs, as it entails a very high cost. We need to bring the Double Tax Deduction Scheme for Internationalizations to allow exporters to deduct against their taxable income...A ceiling of USD 5 lakh may be put under the scheme so that the investment and tax deduction are limited," FIEO Director General Ajay Sahai said.

Mumbai-based exporter and Chairman Technocraft Industries Sharda Kumar Saraf said that Reimbursement of Duties & Taxes on Export production (RoDTEP) is one of the most important tools to support export marketing, but its present budget of about Rs. 40,000 crore, is inadequate.

"We hope the finance minister will take cognizance of this fact and provide a suitable budget for RoDTEP," Saraf said.

Plastics Export Promotion Council of India (Plexconcil) Chairman Arvind Goenka suggested that the import duty on plastic finished goods should be at least 5 per cent higher than polymer raw materials.

"For instance, import duty on PVC Resin is 10 per cent and that on value added PVC goods is also 10 per cent thereby there is no incentive to boost domestic production," Goenka said.

Council for Leather Exports (CLE) Chairman Sanjay Leekha recommended reinstatement of the exemption for duty free import of critical inputs for leather garments and footwear; and extension of the basic customs duty exemption for import of lining and interlining materials.

These measures would promote value addition within the country and make the products competitive in the global markets as compared to the goods of competing countries, besides boosting exports, Leekha said.

He has also recommended reinstatement of basic customs duty on import of wet blue, crust and finished leathers as the exemption was removed last year.

Sharing a similar view, Chairman of Farida Group Rafeeq Ahmed said that steps for the labour-intensive sector - leather in the budget will help in creating more jobs and pushing exports.

"The government should consider removing import duty on finished leather. Measures should be announced for setting up micro parks for the sector," Ahmed said.

Hand Tools Association President S C Ralhan said that the government should announce some provisions to promote container manufacturing in India.

"Budget should also consider extending income tax concessions for MSME exporters," Ralhan said.

During April-December 2021-22, exports rose 49.66 per cent to \$301.38 billion.

(Source : NDTV – 25/01/2022)

INDIA WILL BECOME FASTEST GROWING ECONOMY BUT FAR TO GO, SAYS RBI DY. GOVERNOR



India will once again be among the world's fastest growing economies, but the Reserve Bank of India and the government have their work cut out.

The measures undertaken by the central bank since the pandemic period from March 27, 2020, have "contributed significantly in engineering the turnaround in the Indian economy," said RBI Deputy Governor Michael Patra on Friday at the annual C D Deshmukh Memorial Lecture.

"We are on course to becoming among the fastest growing economies of the world, but there is far to go," Patra said in his speech, adding that private consumption and investment remains a work in progress, while the restoration of livelihoods and the revival of MSMEs is a "formidable task that lies ahead."

"The RBI remains committed to revive and sustain growth on a durable basis and continues to mitigate the impact of Covid-19 on the economy, while ensuring that inflation remains within the target going forward," Patra, who is in charge of monetary policy and a member of the Monetary Policy Committee, said in his speech. The MPC will meet next on February 7-9.

India's gross domestic product is expected to rise by 9.2 per cent during the current financial year, exports grew by 49.7 per cent year-on-year in US dollars terms in the April-December 2021 period, when international trade was disrupted by supply chain issues, while import demand is surging back as domestic demand returns to normal levels.

While employment is yet to recover fully, and labour participation remains low, bank credit is picking up as stress in

banks' balance sheets eases. Inflation is now at a more tolerable level for the RBI, "although it remains elevated amidst high commodity prices, including of crude," Patra said.

The central bank adopted various conventional and unconventional measures to ease the pandemic's impact. Apart from extending a moratorium on repayments, and opening special liquidity help to individuals and small businesses, the RBI's liquidity operations brought down borrowing cost for the government to a nearly 17-year low, despite record borrowing numbers, and softened the borrowing cost for private companies too.

Some of the measures began even before the pandemic, as the central bank anticipated stress, Patra said as an RBI insider privy to the reasoning behind the steps and 13 pandemic speeches of RBI Governor Shaktikanta Das.

Overall, liquidity augmenting measures worth Rs 17.2 trillion (8.7 per cent of nominal GDP of FY21) were announced since February 6, 2020. The policy repo rate was lowered by an unprecedented 115 bps in two phases, aside from a whole host of measures taken by the RBI.

"I would not hazard the audacity of anticipating the judgement of history, but today, India is much better placed to deal with future waves of the pandemic relative to the first wave," the deputy governor said.

"The pandemic continues to shape the future, but the RBI remains armed and battle ready," Patra said, adding, "the lessons of the pandemic will be imbibed and the RBI will emerge stronger and more resilient than before, and committed to its mandate of price stability, keeping in mind the objective of growth."

(Rediff.com – 29/01/2022)

WORLD IS AWASH IN CAPITAL, NO BETTER TIME TO BE AN ENTREPRENEUR: KUMAR BIRLA

A hallmark of some new businesses today is that they seek to use the brute force of capital, combined with smart technology and operations, to create new needs that you didn't even know existed, the chairman of Aditya Birla group said in a blog post on the trends for the new year.



As the valuations of start-ups reach record high, key financial metrics such as healthy cash flows and gross margins will guide future behaviour and trends, chairman of Aditya Birla group, Kumar Mangalam Birla said on Friday.

Birla said the world is awash in capital and there has perhaps rarely been a better time to be an entrepreneur, as everyone from angel investors to public markets line up to back ideas.

“The competition for investment opportunities and the fear of missing out (FOMO) have driven up valuations of many fledgeling companies to stratospheric levels,” he said.

“Historically, the key question for any new business was whether it fulfilled an unmet consumer need. A hallmark of some new businesses today is that they seek to use the brute force of capital, combined with smart technology and operations, to create new needs that you didn’t even know existed,” he said.

For example, Birla said a customer is nowadays receiving groceries at his doorstep in less than 10 minutes and whether it is a service that one cannot live without?

“Clearly many consumers think so. Ultimately, my own view is that at some stage unit economics will have to matter. And trusty old concepts like cash flows and gross margins will guide behaviour and actions. The only sustainable moat is the one based on intellect. Large waves of cheap capital will eventually erode all other entry barriers,” Birla said.

“From Aditya Birla Group’s experience in multiple businesses, across multiple geographies, I can say that in the long run

sustainable and successful businesses are those that generate tangible profits, prosperity, livelihoods quarter after quarter. Valuation and business longevity will automatically follow,” said Birla.

On capex, Birla said with the twin-balance sheet problem of stressed loans and over-leveraged corporates behind India, the coming decade will see an upsurge in capital expenditure across many sectors.

“I believe, we have upon us a forthcoming decade of Capex Mahotsav in India. The private sector is also firing on two-engines, the conventional and the new economy. I call it the ‘double-engine growth’. Investors are excited about growth prospects in core sectors as well as sunrise sectors. In my view, though, the word sunrise sector applies to the entire landscape in India, which includes both conventional sectors such as cement, steel, power and auto and emerging areas like digital and renewables,” Birla said in a web post on the trends for the new year.

On global economy, Birla said the speed and magnitude of the global bounce back has surprised everyone but also left some constituents unprepared. “From being the invisible wheels that oiled the global economy, the nuances of supply chains and the intricacies of multi-modal optimisation have now become central to our discourse,” he said.

“Whiplash effects have come into force, with shortages in humble \$1 semiconductors in Taiwan, and a fire in a lithography factory in Berlin, lengthening the queues for eager buyers of new cars in India. In messages reminiscent of the license era, hopeful car aspirants are being put in long waiting lists as companies scramble to crank up production,” Birla said.

“On the one hand, container shortages in some parts of the world, combined with port pile-ups elsewhere, reinforce the point that the physical world still matters. Despite all triumphant proclamations of software eating the world, the absence of sufficient truck drivers can bring sophisticated operations to a grinding halt. These whiplash effects have called into question a decade-long shift towards increasing efficiency and finely tuned precision operations that optimised operating costs but took away room for margins of error,” Birla said.

(Source : Business Standard – 28/01/2022)

INDIA FLAGS MARKET ACCESS ISSUES IN KOREA DURING TRADE MINISTERS' MEET



India on Tuesday flagged market access issues being faced by domestic players from several sectors such as steel, engineering and agri products in Korea and sought redressal of the matter with a view to boost bilateral trade ties, an official said.

The issue was raised during the meeting between Commerce and Industry Minister Piyush Goyal and Korean Trade Minister Yeo Han-koo. Certain industry groups are of the view that due to some stringent regulatory issues in Korea, there are difficulties in terms of market access for Indian products.

“These barriers need to be addressed and some concessions need to be made on both sides,” the official said. Among the products that are facing market access issues in Korea are bovine meat, grapes, pomegranate, okra and eggplants. The Indian side also raised its concerns over the widening trade deficit with Korea.

The deficit has increased from USD 5 billion in 2008-09 to USD 8 billion in 2020-21. Both the countries implemented the Comprehensive Economic Partnership Agreement (CEPA), a kind of free-trade pact, in January 2010. The bilateral trade between the countries stood at USD 17.5 billion in 2020-21.

The trade is in favour of Korea. In the last fiscal, India's imports stood at USD 128 billion while exports were only USD 4.7 billion.

During the meeting, India sought investments from Korean companies in sectors like semiconductors, chemical batteries for e-vehicles, and technical textiles. India's share in total steel exports to the Republic of Korea is abysmally low and averaged a meagre 0.04 MMT per annum over the last five years.

According to industry experts, Korean steel companies prefer to do business with firms with which they have prior experience of business relations and these things act as an implicit barrier for accessing the Korean steel market.

Similarly, in the case of rice, Korea has introduced the tariff rate quota (TRQ) arrangement for the import of rice from January 2020, under which 3,88,700 tonnes is allocated to its five major importing partners — China, USA, Vietnam, Thailand and Australia. And, as a result, only 20,000 tonnes is left for all other countries across the globe including India.

Indian textiles exporters face the issue of the Korean Certification mark. This mark is required on textile/apparel items (including footwear and leather products) to be imported or sold in Korea. Complaints have also been received from Indian exporters of engineering goods on requirements of local certification from a Korean agency, which is a time-consuming process and takes on an average of 27-28 weeks.

Meanwhile, a joint press communique issued after the meeting of the trade ministers said that both sides have agreed to impart fresh momentum to the discussions on CEPA up-gradation negotiations and also promote extensive business-to-business interactions on trade and investment between the industry leaders of the two countries.

“The two ministers agreed...to address difficulties expressed by the industry from both sides and instructed their respective negotiating teams to meet on a regular basis in order to conclude the CEPA up-gradation negotiations as soon as possible (and) in a time-bound manner,” it said. They expect to achieve the target of USD 50 billion trade before 2030, it added.

(Source : Business Standard – 11/01/2022)

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History and Activities of Indian Leather Technologists' Association

The Indian Leather Technologists' Association (ILTA) was founded by Late Prof. B. M. Das, the engineer of late Shrijoy Puri and father of Indian Leather Technologists on 14th August 1950.

The primary objectives of the Indian Leather Technologists' Association were laid down in the Charter of Association (1950), viz.:

- To bring all concerned with the leather industry under one umbrella.
- To organize research, symposia, seminars in order to disseminate knowledge and foster development for the benefit of all concerned. To offer a common platform for all to interact with each other in order to understand each other's problems and proposals.
- To publish a monthly journal as a supplement to these above objectives. The monthly journal of ILTA known as Journal of Indian Leather Technologists' Association and is the most widely circulated technical journal concerning leather technology.
- To publish and issue for the benefit of its members at various levels of study for the advancement and industry.
- To disseminate facts between school and universities.
- To assist Planning Commission, various Government institutions, Ministry and autonomous bodies in formulating appropriate policies and measures applicable to the industry.
- To organize annual meetings and seminars at their own terms and to conduct general studies for the study.
- To render services related to the growth of the export of leather and leather goods from India.
- To be part of every body working with ILTA has decided that, it is to conduct research on leather science and technology related to leather and leather goods.

INTERNATIONAL & NATIONAL MEETINGS

- ILTA is the Western Society of International Union of Leather Technologists & Chemists Societies (IULTCS), a 112 years old organization and for the first time the IULTCS Congress was organized in January 1989 outside the developed countries in India at Kolkata.
- 20th IULTCS Congress was organized from 14th to 18th January 2019 at Chennai.
- 9th Asian International Conference on Leather Science & Technology (AICLST) was organized by ILTA in 2010 at Bangalore, Karnataka.

SEMINARS/SYMPOSIUMS

ILTA organizes Seminars & Symposiums at regular intervals to disseminate information, knowledge & latest advancement and knowledge for the benefit of all concerned. Free of charge (viz.:

- Prof. B. M. Das Memorial Lecture every year during the Foundation Day Celebrations on 14th August every year.
- Sanjoy Bhaavan Lecture on 14th January every year. The subjects of the lecture are decided for several decades.
- Prof. B. M. Das Memorial Lecture on 14th March every year. The subjects of the lecture are decided for several decades.
- Seminars on the occasion of the International Leather Fair (ILFA) at Chennai in February every year.

ILTA was organized

- Prof. V. Narasimhan Memorial Lecture.
- Seminars on the occasion of the International Union of Leather Technologists & Chemists Societies (IULTCS).
- Seminars in connection of the International Leather Fair (ILFA) and 2019 at Chennai viz. many regular seminars, exhibitions and conferences have followed these regular lectures. Foreign dignitaries during their visits to India have participated in the seminars of ILTA at various times.

PUBLICATION

ILTA has published the following books:

- An Introduction to the Principles of Physical Testing of Leather by Prof. B. M. Das
- Practical Aspects of Manufacture of Upper Leather by Prof. B. M. Das
- An Introduction to the Principles of Leather Manufacture by Prof. B. M. Das
- Analytical Chemistry of Leather Manufacture by Prof. B. M. Das
- Comprehensive Leather Technology by B. M. Das
- Textiles on Footwear and Footwear of Leather by B. M. Das
- Synthetic Tanning Agents by Dr. Sanjay Chandra
- Handbook of Tanning by Prof. B. M. Das

ILTA has a good library & archive with a tremendous scope, periodicals, journals etc.

AWARDS OF EXCELLENCE

- ILTA awards Prof. B. M. Das Memorial, Sanjoy Bhaavan, V. M. Das Memorial and Most Distinguished Member in the year awards of the Distinguished Technical Institute graduate and post graduate levels to acknowledge the brilliant to achieve with the industry.
- J. Bhaavan Memorial Award for the author of the best contribution for the entire year published in the monthly journal of the Indian Leather Technologists' Association (ILTA).

ILTA's

To promote and provide including facilities, to keep pace with the latest design and technology to have better interaction with the domestic buyers. ILTA has been organizing ILEPTO fair at Kolkata from 1977, Bapat from 1980 and Durgam from 2010. To help the big college and small scale leather industries in marketing ILEPTO fair give the exposure for their products. Apart from Kolkata, Bapat & Durgam, ILTA has organized ILEPTO at Shillong, Guwahati, Bhubaneswar and Ranchi.

MEMBERS

The Association's present (as on 31.03.2018) strength of members is more than 800 from all over India and abroad. Primarily the members are leather technologists posted out from Govt. College of Engineering & Leather Technology, Anna University, Chennai, Tatyasaheb Kore Technological Institute, Kalyan; B. V. Ambedkar National Institute of Technology, Jabalpur and Industries from Central Leather Research Institute.

MEMBERSHIP

In order to strengthen its activities, ILTA has considered to have its elected body as ILTA Council, headed by Prof. B. M. Das and have named it 'Sanjoy Bhaavan'.

This Association is managed by an Executive Committee duly elected by the members of the Association. It is a voluntary organization working for the betterment of the leather industry. Most of the Executive Committee members give up remuneration for the services rendered but they get the satisfaction of being a part of the national organization.



ILTA
Since 1950

Indian Leather Technologists' Association

[A Member Society of International Union of Leather Technologists' and Chemists Societies]

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