

Journal of Indian Leather Technologists' Association

VOLUME : LXXIII

No. 10

OCTOBER' 2023

¥2023 2024

Rgtn. No. KOL RMS/074/2022-24 Regd. No. ISSN 0019-5738 RNI No. 2839/57 Date of Publication: 6th

₹50.00

Synopsis of Objectives

- An Association with over 550 members from India and abroad working since last 72 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 72 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]

'Sanjoy Bhavan', 3rdFloor, 44, Shanti Pally, Kolkata- 700 107, WB, India Phone : 91-33-2441-3429 / 3459 WhatsApp +91 94325 53949 E-mail : admin@iltaonleather.org; mailtoilta@rediffmail.com Website : www.iltaonleather.org











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C	ontents		Hony. Editor :	Dr. Goutar	n Mukherjee	
Portfolio		05 - 08	Communicati admin@iltaonl	ons to Edit eather.org; j	tor through E-mail : jiltaeditor@gmail.com	
Editorial		09 - 13	Cover Design M/s TAS Asso	ed & Printe	ed by :	
STAHL Corner			11, Priya Nath	Dey Lane,	Kolkata - 700 036	
			Published &	Printed by	:	
ILTA News		21 - 22	S. D. Set, on b gists' Associat	ehalf of Ind tion	ian Leather Technolo-	
Solidaridad Corpor		22 - 28	Published from :			
Solidaridad Comer		23 - 28	Regd. Office : 'Sanjoy Bhavan', 3rd Floor,			
			44, Shanti Pally, Kasba, Kolkata - 700 107			
IULTCS Corner		29 - 30	Printed at :			
Article -"What Would F	Jannen to the Nature	or Her	M/s TAS Asso	ociate		
Handiwork if Planck's Co	nstant would be Zerol"	by Dr.	11, Priya Nath	Dey Lane,	Kolkata - 700 036	
Buddhadeb Chattopad	hyay & Dr. Subhra	Kumar	Subscription	:		
Mukhopadhyay		31 - 31	Annual	Rs.(INR)	400.00	
	- fulsional		Foreign	\$ (USD)	45.00	
Article - IS AI becoming Human Potential (Conclu	a triend as well as a tr uding Part)" by Dr. G	ireat to	Single Copy	Rs.(INR)	50.00	
Mukherjee			Foreign	\$ (USD)	4.00	
			All other bus	siness con	nmunications should	
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Opinions expressed by the authors of contributions published in the Journal are not necessarily those of the Association



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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Front inside (2 nd Cover)	Rs.	96,000/-
3 rd Cover	Rs.	84,000/-
Back Cover	Rs.	1,20,000/-

Mechanical Specification

Overall size	:	27 cm X 21 cm
Print area	:	25 cm X17 cm

Payment should be made by A/c. Payee Cheque to be drawn in favour of :

Indian Leather Technologists' Association and Payable at Kolkata

Send your enquiries to:

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'SANJOY BHAVAN' 3rd floor, 44, Shanti Pally, Kasba, Kolkata – 700 107 Phone : 91-33-24413429 / 91-33-24413459 E-mail : admin@iltaonleather.org / mailtoilta@rediffmail.com / iltaonleather1950@gmail.com Website : www.iltaonleather.org



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INDIAN ECONOMY - AT A GLANCE



After growing 6.1% in January–March, GDP surged 7.8% year on year in April–June 2023 (Q1 FY 2023). Consumers hiked their spending more than in the prior quarter as inflation fell and confidence in the economy rose. The economic growth is projected by experts to cool slightly in July–September, but will remain among the strongest in Asia. Services activity rose the most in 13 years in July compared to the prior month but then increased slightly less sharply the following month, likely due to a recent uptick in inflation and a loss of agricultural income following the driest August in 120 years. In other news, analysts widely labeled the recent G20 summit held in New Delhi as a victory for India, cementing its role as a rising power by getting G20 leaders to agree on a joint declaration despite divisions between the West and Russia.

Inflation eased to 6.8% in August from 7.4% in July, as vegetable prices normalized after spiking in July. Looking ahead, our panelists expect inflation to return to the Central Bank's 2.0–6.0% target range by the end of this calendar year and then trend down to somewhat above the midpoint of the target range in FY 2024 as weather conditions normalize.





Editorial _____

Economic Data of India

	2018	2019	2020	2021	2022
Population(million)	1,369	1,383	1,396	1,410	1,423
GDP(USD bn)	2,703	2,835	2,671	3,150	3,391
GDP per capita(USD)	1,974	2,050	1,913	2,234	2,382
GDP(INR bn)	188,997	201,036	198,299	234,710	272,407
Economic Growth(Nominal GDP, ann. var. %)	10.6	6.4	-1.4	18.4	16.1
Economic Growth(GDP, ann. var. %)	6.5	3.9	-5.8	9.1	7.2
Private Consumption(ann. var. %)	7.1	5.2	-5.2	11.2	7.5
Government Consumption(ann. var. %)	6.7	3.9	-0.9	6.6	0.1
Fixed Investment(ann. var. %)	11.2	1.1	-7.3	14.6	11.4
Exports(G&S, ann. var. %)	11.9	-3.4	-9.1	29.3	13.6
Imports(G&S, ann. var. %)	8.8	-0.8	-13.7	21.8	17.1
Agriculture(ann. var. %)	2.1	6.2	4.1	3.5	4
Industry(ann. var. %)	5.3	-1.4	-0.9	11.6	4.4
Services(ann. var. %)	7.2	6.4	-8.2	8.8	9.5
Industrial Production(ann. var. %)	3.8	-0.8	-8.5	11.4	5.3
Fiscal Balance(% of GDP)	-3.4	-4.6	-9.2	-6.8	-6.4
Public Debt(% of GDP)	70.4	75	88.5	84.7	83.1
Money(ann. var. of M2 %)	14.1	11.1	16.1	10.7	6.9
Inflation(CPI, ann. var. %, eop)	2.9	5.8	5.5	7	5.7
Inflation(CPI, ann. var. %, aop)	3.4	4.8	6.2	5.5	6.7
Inflation(WPI, ann. var. %, eop)	3.1	0.4	7.9	14.6	1.4
Inflation(WPI, ann. var. %, aop)	4.3	1.7	1.3	13	9.4
RBI Repurchase Rate(%, eop)	6.25	4.4	4	4	6.5
10-Year Bond Yield(%, eop)	7.35	6.14	6.18	6.84	7.31
Stock Market(ann. var. of BSE SENSEX %)	5.9	14.4	15.8	22	4.4
Exchange Rate(INR per USD, eop)	69.29	75.35	73.16	75.86	82.14
Exchange Rate(INR per USD, aop)	68.41	70.41	74.12	73.94	78.6
Current Account Balance(USD bn)	-57.2	-24.2	24.6	-39	-66.5
Current Account Balance(% of GDP)	-2.1	-0.9	0.9	-1.2	-2



Editorial _

	2018	2019	2020	2021	2022
Merchandise Trade Balance(USD bn)	-184	-161	-100	-191	-272
Merchandise Exports(USD bn)	330	313	292	422	438
Merchandise Imports(USD bn)	514	475	392	613	709
Merchandise Exports(ann. var. %)	8.8	-5.1	-6.9	44.7	3.8
Merchandise Imports(ann. var. %)	10.6	-7.7	-17.4	56.4	15.7
Foreign Direct Investment(USD bn)	30.7	43	44	38.6	28
International Reserves(USD bn)	413	478	577	607	578
International Reserves(months of imports)	9.6	12.1	17.7	11.9	9.8
External Debt(USD bn)	543	558	574	619	625
External Debt(% of GDP)	20.1	19.7	21.5	19.7	18.4

Industrial production expanded 5.6% year on year in July (June: +3.8% yoy). The figure marked the best reading since February. The reading reflected a broad-based improvement, with activity in the manufacturing, mining and electricity sub-sectors all improving in July.

Meanwhile, annual average industrial production growth rose to 3.7% in July (June: +3.4%). This signals an improving trend in the industrial sector.





Editorial ____

Merchandise exports declined 6.8% annually in August, following July's 16.0% plummet. August's outturn marked the smallest decline since January 2023. Meanwhile, merchandise imports fell 5.2% on an annual basis in August (July : -17.0% yoy), marking the strongest result since January 2023.

the previous month, recording a USD 24.2 billion deficit in August (July 2023: USD 20.7 billion deficit; August 2022: USD 24.9 billion deficit). Lastly, the trend pointed up, with the 12month trailing merchandise trade balance recording a USD 261.0 billion deficit in August, compared to the USD 261.7 billion deficit in July.



As a result, the merchandise trade balance deteriorated from

The S&P Global Composite Purchasing Managers' Index (PMI) came in at 60.9 in August, down from July's 61.9. However, the index remained at one of the highest levels in 12 years, signaling a strong, albeit softer, improvement in private sector operating conditions from the previous month. The July and August data further suggest that GDP growth should once again be one of the highest in Asia in the second quarter of FY 2023 (July–September).

The Manufacturing PMI clocked in at 58.6 in August, up from July's 57.7. Lastly, the Services PMI decreased to 60.1 in August (July: 62.3). The gap between the two sectors therefore narrowed in August, suggesting broad swathes of the economy are firing on all cylinders.

In both sectors, new orders and output continued to soar at some of the speediest rates in over a decade. Activity was supported by foreign demand, which rose sharply in both sectors. This strong activity led firms to further beef up their workforce. Finally, business sentiment in both sectors remained historically elevated.

S&P Global's Pollyanna De Lima said: "Favourable demand trends also led to the joint-fastest increase in prices charged for Indian services in over six years, which may prompt attention from policymakers and potentially delay cuts to the benchmark repo rate."



At a glance, India is surging ahead. Let us be part of it.

Goultan Mulcherjee

Dr. Goutam Mukherjee Hony. Editor, JILTA





ILTA for Green Technology





Stahl Corner

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.





Stahl Corner





STAHL SECURES ISCC PLUS RE-CERTIFICATION FOR FACILITIES IN GERMANY AND THE NETHERLANDS

Stahl, a leading provider of coating technologies, announces the successful recertification of two manufacturing sites, in Germany and the Netherlands, according to the ISCC PLUS standard. The re-certification of the sites by certifying body TÜV NORD means Stahl can continue to scale up its use of renewable feedstocks across its polyurethane portfolio and beyond. This will enable the company to offer customers more products containing attributed renewable raw materials. The development marks a key step forward in Stahl's supply chain transparency ambitions, targeting greenhouse gas (GHG) emission reductions across the value chain.



The ISCC PLUS-certified products manufactured at Stahl's Waalwijk and Leinfelden locations include selected polyurethane coatings for flexible materials such as textiles, film and paper. The polyurethanes are made with between 20% and 70% renewable attributed biomass and recycled content. These products have the same performance as traditional fossil-based alternatives.

Renewable content is measured and verified using the mass balance methodology. This is a calculation-based approach that tracks the flow of materials through complex supply chains. Mass balance-certified products, such as those adhering to the ISCC PLUS standard, typically contain a mix of renewable- and non-renewable-derived feedstocks. The mass balance principle ensures that the percentage of renewable feedstocks always remains consistent, from sourcing to finished product.

Michael Costello, Group Director of ESG at Stahl:fl "Mass-balance certification verifies that Stahl's manufacturing sites adhere to the highest standards of traceability, which is required to produce high-performing products containing both fossil- and renewable-derived feedstocks. Certification also requires a transparent chain of custody for the renewable raw materials used by the reporting company. This is essential to mitigate potential upstream supply chain risks, making ISCC PLUS certification a key tool for promoting greater supply chain transparency across the industry."fl

Lidia Martínez, ESG Supply Chain Transparency Manager at Stahl:fl "We are pleased to offer customers more mass balance-certified products made with ISCC PLUS-certified raw materials. Thanks to our re-certification, we can keep expanding our range of mass balance-certified polyurethanes made with bio-based, bio-circular and circular raw materials. ISCC PLUS re-certifications are an assurance of the quality and transparency of Stahl's mass balance bookkeeping. Alignment with ISCC PLUS is one of the ways we support the responsible sourcing of renewable feedstocks by providing proof of traceability."

About ISCC PLUS

ISCC – International Sustainability and Carbon Certification – is a certification system that offers solutions for the implementation and certification of sustainable, deforestation-free and traceable supply chains for a wide range of bio-



Stahl Corner

based and circular materials. These include biomass waste and residues, non-biological renewables and recycled carbon materials. Independent third-party certification ensures compliance with high standards of ecological and social sustainability, as well as traceability, throughout the supply chain. All ISCC PLUS certificates are publicly available via the ISCC PLUS portal.

About TÜV NORD

A leading certifying body with more than 1,200 expert auditors all over the world, TÜV NORD provides professional audit and certification services across a range of industries, from aerospace to food service. TÜV NORD has been Stahl's certification partner since 2022 when it certified compliance with the ISCC PLUS standard at Stahl's Waalwijk and Leinfelden sites.

(Stahl News – 18/07/2023)

STAHL DEMONSTRATES PROGRESS ON ESG AMBITIONS WITH SECOND CONSECUTIVE PLATINUM ECOVADIS RATING



Stahl, a leading provider of coating technologies for flexible substrates, has been awarded a Platinum rating by the sustainability rating agency EcoVadis for the second consecutive year. For the 2023 EcoVadis assessment, Stahl's rating increased by three points compared to its 2022 score, reflecting the company's improved performance in the area of labour and human rights.





EcoVadis is a globally recognised, evidence-based rating platform that assesses the performance of more than 75,000 organisations against key sustainability criteria across four categories: Environment, Labour & Human Rights, Ethics and Sustainable Procurement. For the 2023 EcoVadis assessment, Stahl received an overall score of 80 out of 100, up from 77 in 2022. This score indicates an advanced level of sustainability maturity and ensures that Stahl retains its Platinum rating. This is awarded to the top 1% of companies assessed by EcoVadis. Stahl achieved its first Platinum rating in 2022, having undergone its first EcoVadis assessment in 2015.

Ingrid Weijer, ESG Performance Manager at Stahl:fl "We are proud to have maintained our Platinum EcoVadis rating for the second year in a row. This score reflects Stahl's flongoing commitment to transparency and the new policies and initiatives that were introduced over the past 12 months. But we are not perfect, and the EcoVadis evaluation criteria are becoming more demanding, so we will continue to work to improve our performance into next year."

Progress in the Labour & Human Rights category

The 2023 EcoVadis assessment revealed the progress Stahl is making in the Labour & Human Rights category, where Stahl scored 90 out of a possible 100 points. This reflects the company's recent work to improve its health and safety management systems. In particular, the majority of Stahl's global manufacturing sites are now ISO 45001 certified and more than 94% are ISO 14001 certified. Stahl has also taken steps to improve its approach to employee career development and well-being. These include the creation of an individual career plan for all employees and the introduction of a new company-wide employee satisfaction survey.

Stahl moves forward with 2030 ESG ambitions

Stahl has set a 2030 target to maintain its EcoVadis Platinum rating by working closely with its value chain partners to help them reduce their impact. Infl2022, 83% offlStahl's total spend on raw materials was sourced from EcoVadis-rated suppliers.



(Stahl News - 19/09/2023)



Stahl Corner







From the desk of General Secretary



65[™] ANNUAL GENERAL MEETING OF ILTA

As intimated to all eligible Members vide 65th AGM Notice posted through Registered Book Post on 6th September' 2023, this was held on 29th September, 2023 at 03.00 PM IST (Registration started from 02.30 pm IST) at the Seminar Hall-19A of Science City, Kolkata, as per the following Agenda.

A. Confirmation of the Draft Proceedings of 64th Annual General Meeting held on 14th October, 2022.

Being no question raised this was passed unanimously. Proposed by Mr. Gholam Mohammad and seconded by Mr. Tarak Ch. Saha.



B. To consider and adopt the audited Balance Sheet and Statement of Accounts for the Financial Year ending 31st March 2023.

Mr. Susanta Mallick, General Secretary explained the above and being no question raised this was passed unanimously. Proposed by Mr. Tarak Ch. Saha and seconded by Mr. Arijit Chakraborty.

C. To consider and adopt the Annual Report of the General Secretary on behalf of the Executive Committee.

This also explained by Mr. Susanta Mallick, General Secretary and being no question raised this was passed unanimously. Proposed by Mr. Kanak Kr. Mitra and seconded by Mr. Tarak Ch. Saha.

D. To appoint the Auditor in place of M/s Ray & Ray who are retiring but are eligible for reappointment.

This was confirmed with a note that M/s Ray & Ray would be appointed as the Auditor of ILTA for the F.Y. 2023-24 at a mutually accepted remuneration of Rs. 50,000/- + GST as applicable. Proposed by Mr. Tarak Ch. Saha and seconded by Mr. Aloke Kr. Basu.

With the Vote of thanks to the Chair the meeting winded up.

14[™] ASIA INTERNATIONAL CONFERENCE ON LEATHER SCIENCE & TECHNOLOGY (AICLST)

ILTA is on the way to organize the 14th Asia International Conference on Leather Science & Technology (AICLST) in the year 2026 at Kolkata, India as endorsed by the IULTCS Secretariat.

It is proposed that this would be organized during the Platinum Jubilee Celebration year of ILTA from August, 2025 to July, 2026, preferably nearer the time Chennai Trade Fair in February, 2026.

Planning & Details of the program would be shared in due course.

(Susanta Mallick) General Secretary





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We have started to post Printed copy of JILTA from April' 2022 to members and all concerned as it was before Covid period. Simultaneously we have been sending the e-copy of JILTA through email also to all the concerned receivers.

If you are not receiving JILTA by Post or through email, may please verify your Postal Address and/or 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. : <u>24413429 / 3459</u>. 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.

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.

General Secretary and the Members of the Executive Committee are available to interact with members at 18.30 hrs, at our Registered Office on every Thursday



Solidaridad Corner

Solidaridad

With over 50 years of experience in developing sustainable solutions to make communities more resilient, Solidaridad has been working on many different issues, from supporting marginalized communities to fostering a more sustainable supply chain.





Solidaridad Corner



www.iltaonleather.org JILTA

OCTOBER, 2023 || 24



Adopting Eco-Friendly Practices: SWaSS (Smart Water-automated Saving System) Revolutionizes Water Efficiency in Leather

In today's fast-expanding industrial landscape, sustainability has become a critical part of every sector, including the leather business. With global awareness of environmental problems, innovative solutions that combine technology and environmental consciousness are gaining traction. The Smart Water-automated Saving System (SWaSS), for example, is revolutionizing the way the leather industry addresses water usage and conservation.

SWaSS: A Brief Overview

The leather industry, known for its sophisticated procedures and resource-intensive nature, has long struggled with inefficient water management. SWaSS is a game-changing technology that optimizes water use across the leather-manufacturing process by leveraging automation, data analytics, and smart technologies. It guarantees optimum use of water, while minimizing waste by monitoring usage at every stage — from soaking and tanning to finishing.

Benefits of SWaSS for the Leather Industry

- 1. Reduced Water Consumption: SWaSS uses real-time data and predictive analytics to identify places where water is being consumed and squandered away. The technology streamlines water usage by identifying inefficiencies, resulting in considerable savings in consumption. This not only conserves a valuable resource; it also leads to cost savings.
- 2. Enhanced Operational Efficiency: SWaSS's automated nature reduces the need for manual monitoring and intervention, allowing labor resources to be used for other useful activities. This improved operational efficiency leads to increased production and less downtime, which eventually benefits the bottom line.
- **3. Eco-Friendly Reputation:** Companies that implement sustainable practices enjoy a competitive advantage with consumers demanding environmentally responsible products. The implementation of SWaSS displays a commitment to responsible manufacturing, helping companies improve their brand perception and gain consumer loyalty.
- 4. Regulatory Compliance: With global norms on sourcing emphasizing emission reduction and demanding efficiency in resource utilization, organizations failing to fulfil the requirements can suffer penalties as well as reputational harm. SWaSS assists businesses in staying compliant by adhering to water-use regulations and reducing their environmental imprint.







5. Cost Savings: While the initial investment in SWaSS technology may appear steep, the long-term advantages compensate the cost and more. Reduced water use immediately correlates to decreased water bills, and increased efficiency contributes to labor- and energy-cost reductions.

A complete cost-benefit analysis, therefore, is required to analyze the genuine value proposition of SWaSS in the leather sector.

The 'Cost' Factor

- 1. Initial Investment: Adopting SWaSS necessitates an initial investment in sensors, data-gathering equipment, and software. While this may require significant expenditure, it is important to see it as an investment towards long-term sustainability and efficiency improvements.
- 2. **Training:** Workforce training is required to guarantee that the staff understand how to use and interpret SWaSS data efficiently. This cost can be reduced by implementing effective training programs.
- **3. Maintenance:** SWaSS, like any technical system, requires regular maintenance and upgrades to guarantee peak operation. Incorporating these expenses into the study gives a more realistic view of the investment's long-term consequences.

The 'Benefit' Factor

The leather industry is at a crossroads. However, as the world adopts a greener way of life, SWaSS stands as an implementable advancement within the leather sector, demonstrating that technology and sustainability can work together to accomplish astonishing results.

Environmental Impact and Leather-Process Benefits of SWaSS

The leather sector, which has historically been linked with resource-intensive practices, is experiencing a transformation in favour of sustainability. SWaSS marks a big step forward in reducing the environmental footprint of leather manufacturing while reaping considerable advantages in the processing stage. This cutting-edge technology not only tackles the industry's water consumption issues, it also improves operational efficiency and promotes ethical production.

1. Reducing Water Consumption and Environmental Footprint

SWaSS's capacity to revolutionize water management in the leather-production process is one of its most enticing features. The leather industry has long been chastised for its high-water use, which not only limits local water supplies but also adds to pollution through inappropriate waste-water disposal. SWaSS addresses these concerns by:







- a. Optimizing Water Usage: SWaSS employs real-time data monitoring and predictive analytics to identify areas of water wastage and inefficiency. By pinpointing where excessive water is being used, the system enables manufacturers to adjust processes and reduce consumption.
- **b. Minimizing Wastewater:** Traditional leather production frequently creates large volumes of effluentladen chemicals used in tanning and finishing. SWaSS's water-saving capabilities reduce wastewater output, easing the pressure on wastewater treatment facilities and lowering pollutant discharge into local ecosystems.
- **c. Conserving Resources:** SWaSS helps preserve freshwater resources by reducing water use. This is especially important in areas facing water shortage. SWaSS adds greatly to a company's sustainability goals as a responsible water-use solution. This positive environmental impact has the potential to boost brand reputation and consumer loyalty.

2. Benefits in Leather-production Process

SWaSS offers numerous benefits beyond its environmental impact, by enhancing various aspects of the leather-production process:

- **a. Operational Efficiency:** The automation and real-time monitoring capabilities of SWaSS streamline operations by eliminating the need for manual data collection and intervention. This results in reduced downtime, increased productivity, and a more efficient workflow.
- **b. Predictive Maintenance:** SWaSS's data-driven insights can predict potential issues or maintenance needs, allowing manufacturers to proactively address concerns before they escalate. This minimizes production disruptions and extends the lifespan of equipment.
- **c.** Quality Enhancement: Consistent water management provided by SWaSS leads to more uniform processing, resulting in higher-quality leather products. Uniform water distribution during the tanning and finishing stages contributes to improved texture, color, and overall appearance.
- **d. Regulatory Compliance:** Avoiding regulatory fines and penalties by adhering to water-use limitations and environmental requirements on a continuous basis is a clear financial gain.
- e. Cost Savings: Beyond the environmental benefits, SWaSS translates into tangible financial gains. Reduced water consumption leads to lower water bills, while operational efficiencies cut labor and energy costs. Over time, these savings can significantly impact a company's profitability.









Caption: A SWaSS Dashboard

Meeting Sustainable Development Goals (SDGs) and Consumer Demand

As global awareness of environmental issues increases, consumers are increasingly seeking products that align with such values. SWaSS enables leather manufacturers to position themselves as environmentally conscious and socially responsible brands. By adopting sustainable practices and promoting reduced water consumption, companies can attract eco-conscious consumers and foster long-term brand loyalty.

- 1. SDG 6 (Clean Water and Sanitation): SWaSS directly contributes to SDG 6 by promoting efficient water usage and reducing water wastage in the leather-production process. This aligns with the goal of ensuring availability and sustainable management of water and sanitation for all.
- 2. SDG 9 (Industry, Innovation, and Infrastructure): SWaSS embodies innovation in the context of industry and infrastructure. Its technology-driven approach enhances industrial efficiency, reduces resource consumption, and promotes sustainable practices within the leather-manufacturing sector.
- **3. SDG 12 (Responsible Consumption and Production):** By optimizing water consumption and reducing waste generation, SWaSS supports SDG 12's call for responsible production and consumption patterns. It helps industries transition towards more sustainable practices that minimize environmental impact.

Solidaridad







- 4. SDG 13 (Climate Action): SWaSS indirectly meets SDG 13's objective by mitigating the environmental impact of leather production. By reducing water usage and minimizing pollution, it aids in reducing the leather industry's carbon footprint and overall environmental impact.
- 5. SDG 14 (Life below Water): While the leather industry's impact on aquatic ecosystems may not be the primary focus of SWaSS, its water-saving features contribute to minimizing the release of pollutants and chemicals into waterbodies, aligning with SDG 14's goal of conserving and sustainably using marine resources.
- 6. SDG 15 (Life on Land): Leather production often relies on resources sourced from land ecosystems. SWaSS's sustainable practices, including reduced water usage and pollution prevention, contribute to preserving terrestrial ecosystems, thereby aligning with SDG 15's objectives.
- 7. SDG 17 (Partnerships for the Goals): SWaSS's implementation encourages collaboration between industries, technology providers, and policymakers to achieve shared sustainability objectives. By fostering partnerships, SWaSS closely follows the essence of SDG 17, which aims to strengthen global cooperation for sustainable development.

While the primary focus of SWaSS is water conservation and efficiency within the leather industry, its impact extends beyond these specific SDGs. Its adoption sets a precedent for industries to integrate innovative technologies to address environmental challenges, promote responsible practices, and contribute to broader sustainability goals.

Solidaridad







Solidaridad Corner











Netherlands Enterprise Agency

Solidaridad











INTERNATIONAL UNION OF LEATHER TECHNOLOGISTS AND CHEMISTS SOCIETIES

(www.iultcs.org)

Leather Technological Olympic Games to Promote the Revival of the Global Leather Industry



The 37th IULTCS congress, the three-day "Olympic Games" of Leather technology, will kick off in Chengdu, Sichuan Province on October 18, 2023. The industrial experts, scholars and business representatives of the global leather industry will gather in Chengdu to share the latest scientific achievement and discuss the future development of science and technology in the industry. The Scientific Committee has confirmed the presenter of the "Heidemann Lecture", as well as selected 60 oral presentations from the papers submitted by leather science and technology workers around the world. In addition, there will be 94 papers to be posted during the congress. The organization of the congress has received continuous attentions from global leather industry colleagues. So far, there are more than 300 registered participants from 15 countries and regions.

During the past years, the global leather market continues to be sluggish due to the impact of multiple factors. With the increasing pressure in leather industry, the scientific and technological innovation has become the key way for achieving breakthroughs in the leather industry. In this context, 2023 IULTCS congress will play an important role in developing science and technology, increasing confidence, and accelerating the revival of high-quality leather industry.

For further details, please visit the official XXXVII IULTCS Congress website (www.iultcs2023.org).

(https://www.iultcs2023.org - 02/10/2023)

Important Notice: Cancellation of Virtual Portal in 2023 IULTCS Congress

The Organizing Committee of the 37th International Union of Leather Technologists and Chemists Societies (IULTCS) Congress is announcing, with sincere consideration, the cancellation of the virtual portal of the IULTCS Congress in Chengdu, which was originally alongside the on-site conference.

After a meticulous analysis of the registration data, we have noted that the number of registrants for the virtual conference has been considerably lower than anticipated. The paramount objective of our conference has consistently been to provide dynamic and engaging platform for knowledge sharing and networking. Given the limited interest demonstrated by online registrants, we have determined that allocating quite some resources and cost to manage the virtual component would not be justified. Consequently, we will reallocate these resources to enhance the organization of an immersive on-site congress.





INTERNATIONAL UNION OF LEATHER TECHNOLOGISTS AND CHEMISTS SOCIETIES (WWW.iultcs.org)

The Organizing Committee will promptly reach out to the registrants who have already registered for the virtual conference. Meanwhile, to those who are unable to attend the in-person conference, the entire conference proceedings will be recorded and uploaded to the conference website (https://www.iultcs2023.org/) after the IULTCS Congress concludes.

We have now dedicated our efforts to ensure an outstanding in-person experience during the physical gathering of the congress, which will take place as scheduled, and are committed to providing a platform that includes Heidemann Lecture, oral presentations, speed oral session, poster showcase, networking opportunities and lab visiting, which encourages collaboration, learning, and meaningful interactions among all attendees.

We apologize for any inconvenience caused and appreciate your understanding. We extend our heartfelt gratitude to all participants for their continued enthusiasm and commitment to the IULTCS Congress. We look forward to welcoming you in-person, as we come together to celebrate the innovations in leather technology and chemistry.

(https://www.iultcs2023.org - 05/08/2023)



Innovations to Make Leather Irreplaceable

The 37th Congress of the International Union of Leather Technologists and Chemists Societies (IULTCS) will be held in Chengdu, China during October 17-20, 2023. The Congress is organized by China Leather Industry Association, hosted by the College of Biomass Science and Engineering in Sichuan University. This will be the second time that the Congress comes to China ever since the IULTCS Congress was successfully held in Beijing in 2009. This Congress will provide an international platform for high-end academic communication regarding important aspects in leather industry, and also provide a good opportunity for scientific and technological practitioners from all around the world to conduct cooperation with those from China.

The organizing committee of the Congress will work together with all colleagues in the leather industry to hold a successful, productive conference to promote the sustainable development of the leather industry.



WHAT WOULD HAPPEN TO THE NATURE OR HER HANDIWORK IF PLANCK'S CONSTANT WOULD BE ZERO ?



Article-

¹Dr. Buddhadeb Chattopadhyay ²Dr. Subhra Kumar Mukhopadhyay

¹ Former Principal of Govt. College of Engineering & Leather Technology, Kolkata ² Govt. College of Engineering & Leather Technology, Kolkata

This is an interesting question asked by a student. It takes a lot of imagination to deduce. Planck's Constant $h = 6.607015*10^{-34}$ m².kg/s (due to Max Planck, the father of the Quantum mechanics). This is indeed infinitesimally small quantity, almost close to zero, because the prime numbers start from 27th decimal place. Hence, this is truly a valid question.

The difficulties arise because of the confusion to decide from where to start. Though this constant is uniquely small but beautiful. It seems the Nature is governing her handiwork partitioned into two different compartments with two different sets of rules.

One compartment is macroscopic, which is by and large governed mostly by deterministic classical physics; while the other, microscopic compartment is governed by nondeterministic quantum mechanics. Our day-to-day experience concerns mostly with the former compartment. Because the quantum particles like electron, proton, neutron etc are not the matters that can neither be seen, nor can be experienced in our day-to-day life.

We don't know quite exactly whether for better understanding of the students, we should start from macroscopic and then go to microscopic world or vice versa! If h becomes equal to zero, there would be no Quantum mechanics. Only deterministic classical mechanics would govern. If the value of h becomes large, then even for understanding macroscopic bodies the nondeterministic Quantum mechanics would be required and that would be end of Classical mechanics. Because the value of h is so tiny, the Quantum mechanics only would be required for studying microscopic matters like, electron, proton, or neutron etc.

Macroscopic world starts with what we see around – biotic, abiotic, stars, planets, ocean, mountain etc. In this world the

minuscular Planck' constant has no direct relevance. But indirectly it occupies quite a central place. This is because everything is composed of very large and unique structures of atoms and molecules. There would be no electronics, IT Techspace, communication etc. would never be possible, if the Planck's constant is reduced to zero.

Now if h becomes equal to zero, then simply there would be no radiation energy in quanta. All the phenomena or the Instruments that considers the molecular, atomic, or nuclear transitions would not exist.

Since the external electromagnetic radiation falling on a molecule causes perturbation first and then transition takes place from lower energy state to higher energy state consuming matching quantised energy of radiation, these effects will not be possible. As a result, there would be no colour first. The instruments that are used to gualitatively and guantitatively the molecules or atoms or their nucleus like Spectrophotometers (Uv-vis, IR, ESR, AAS or NMR, MRCP etc.) will not work at all. In health care as of today, this would affect badly, where pathology now is dependent on spectrophotometer greatly. Since MRI and MRCP uses the same principle of NMR with an addition of image processing will also cease to exist. Non-zero Planck's constant brings in uncertainty. We may think of commutator bracket of position and momentum. As a result, Nature needs a statistical description. Whereas the average or expectational values of quantum variables satisfy classical motion. So, classical description is an average i.e., less accurate description of all microscopic uncertain description. At which scale of largeness this average description will be accurate depends on the value of Planck's constant.

This is beautiful. It is small no doubt but magnificent!







Green Technology Choices:

The Environmental and Resource Implications of Low-Carbon Technologies

INTERNATIONAL RESOURCE PANEL REPORT



IS AI BECOMING A FRIEND AS WELL AS A THREAT TO HUMAN POTENTIAL

(Concluding Part)

Dr. Goutam Mukherjee WBGS(A)

Group A Officer, Govt. of West Bengal. Professor, Govt. College of Engineering & Leather Technology,

Salt Lake, Kolkata

Applications in Various Sectors

Finance

Investments in financial AI in the United States tripled between 2013 and 2014 to a total of \$12.2 billion. According to observers in that sector, "Decisions about loans are now being made by software that can take into account a variety of finely parsed data about a borrower, rather than just a credit score and a background check." In addition, there are so-called robo-advisers that "create personalized investment portfolios, obviating the need for stockbrokers and financial advisers.' These advances are designed to take the emotion out of investing and undertake decisions based on analytical considerations, and make these choices in a matter of minutes.

A prominent example of this is taking place in stock exchanges, where high-frequency trading by machines has replaced much of human decision-making process. People submit buy and sell orders, and computers match them in the blink of an eye without human intervention. Machines can spot trading inefficiencies or market differentials on a very small scale and execute trades that make money according to investor instructions. Powered in some places by advanced computing, these tools have much greater capacities for storing information because of their emphasis not on a zero or a one, but on "quantum bits" that can store multiple values in each location. That dramatically increases storage capacity and decreases processing times.

Fraud detection represents another way AI is helpful in financial systems. It sometimes is difficult to discern fraudulent activities in large organizations, but AI can identify abnormalities, outliers, or deviant cases requiring additional investigation. That helps managers find problems early in the cycle, before they reach dangerous levels.

National Security

Al plays a substantial role in national defence. Through its Project Maven, the American military is deploying Al "to shift through the massive troves of data and video captured by surveillance and then alert human analysts of patterns or when there is abnormal or suspicious activity." According to Deputy Secretary of Defence Patrick Shanahan, the goal of emerging technologies in this area is "to meet our war fighters' needs and to increase [the] speed and agility [of] technology development and procurement."

The big data analytics associated with AI will profoundly affect intelligence analysis, as massive amounts of data are shifted in near real time-if not eventually in real time-thereby providing commanders and their staffs a level of intelligence analysis and productivity heretofore unseen. Command and control will similarly be affected as human commanders delegate certain routine, and in special circumstances, key decisions to Al platforms, reducing dramatically the time associated with the decision and subsequent action. In the end, warfare is a time competitive process, where the side able to decide the fastest and move most quickly to execution will generally prevail. Indeed, artificially intelligent intelligence systems, tied to AIassisted command and control systems, can move decision support and decision-making process to a speed vastly superior to the speeds of the traditional means of waging war. So fast will be this process, especially if coupled to automatic decisions to launch artificially intelligent autonomous weapons systems capable of lethal outcomes, that a new term has been coined specifically to embrace the speed at which war will be waged: hyper-war.

While the ethical and legal debate is raging over whether America will ever wage war with artificially intelligent autonomous lethal

Corresponding author E-mail : gmgcelt@gmail.com / gmclt@hotmail.com



Article =



systems, the Chinese and Russians are not nearly so mired in this debate, and we should anticipate our need to defend against these systems operating at hyper-war speeds. The challenge in the West of where to position "humans in the loop" in a hyperwar scenario will ultimately dictate the West's capacity to be competitive in this new form of conflict.

Just as AI will profoundly affect the speed of warfare, the proliferation of zero day or zero second cyber threats as well as polymorphic malware will challenge even the most sophisticated signature-based cyber protection. This forces significant improvement to existing cyber defences. Increasingly, vulnerable systems are migrating, and will need to shift to a layered approach to cybersecurity with cloud-based, cognitive AI platforms. This approach moves the community toward a "thinking" defensive capability that can defend networks through constant training on known threats. This capability includes DNA-level analysis of heretofore unknown code, with the possibility of recognizing and stopping inbound malicious code by recognizing a string component of the file. This is how certain key U.S.-based systems stopped the debilitating "Wanna Cry" and "Petya" viruses.

Preparing for hyper-war and defending critical cyber networks must become a high priority because China, Russia, North Korea, and other countries are putting substantial resources into Al. In 2017, China's State Council issued a plan for the country to "build a domestic industry worth almost \$150 billion" by 2030. As an example of the possibilities, the Chinese search firm Baidu has pioneered a facial recognition application that finds missing people. In addition, cities such as Shenzhen are providing up to \$1 million to support Al labs. That country hopes Al will provide security, combat terrorism, and improve speech recognition programs. The dual-use nature of many Al algorithms will mean Al research focused on one sector of society can be rapidly modified for use in the security sector as well.

Health Care

Al tools are helping designers improve computational sophistication in health care. For example, Merantix is a German company that applies deep learning to medical issues. It has an application in medical imaging that "detects lymph nodes in the human body in Computer Tomography (CT) images.' According to its developers, the key is labelling the nodes and identifying small lesions or growths that could be problematic. Humans can do this, but radiologists charge \$100 per hour and may be able to carefully read only four images an hour. If there were 10,000 images, the cost of this process would be \$250,000, which is prohibitively expensive if done by humans. What deep learning can do in this situation is train computers on data sets to learn what a normal-looking versus an irregularappearing lymph node is. After doing that through imaging exercises and honing the accuracy of the labelling, radiological imaging specialists can apply this knowledge to actual patients and determine the extent to which someone is at risk of cancerous lymph nodes. Since only a few are likely to test positive, it is a matter of identifying the unhealthy versus healthy node.

Al has been applied to congestive heart failure as well, an illness that afflicts 10 percent of senior citizens and costs \$35 billion each year in the United States. Al tools are helpful because they "predict in advance potential challenges ahead and allocate resources to patient education, sensing, and proactive interventions that keep patients out of the hospital."

Criminal Justice

Al is being deployed in the criminal justice area. The city of Chicago has developed an Al-driven "Strategic Subject List" that analyses people who have been arrested for their risk of becoming future perpetrators. It ranks 400,000 people on a scale of 0 to 500, using items such as age, criminal activity, victimization, drug arrest records, and gang affiliation. In looking at the data, analysts found that youth is a strong predictor of violence, being a shooting victim is associated with becoming a future perpetrator, gang affiliation has little predictive value, and drug arrests are not significantly associated with future criminal activity. Judicial experts claim Al programs reduce human bias in law enforcement and leads to a fairer sentencing system.

R Street Institute Associate Caleb Watney states that empirically grounded questions of predictive risk analysis play to the strengths of machine learning, automated reasoning and other forms of AI. One machine-learning policy simulation concluded that such programs could be used to cut crime up to 24.8 percent with no change in jailing rates, or reduce jail populations by up to 42 percent with no increase in crime rates.

However, critics worry that AI algorithms represent "a secret system to punish citizens for crimes they haven't yet committed. The risk scores have been used numerous times to guide large-scale roundups." The fear is that such tools target people of colour unfairly and have not helped Chicago reduce the murder wave that has plagued it in recent years.

Despite these concerns, other countries are moving ahead with rapid deployment in this area. In China, for example, companies already have "considerable resources and access to voices,



faces and other biometric data in vast quantities, which would help them develop their technologies." New technologies make it possible to match images and voices with other types of information, and to use AI on these combined data sets to improve law enforcement and national security. Through its "Sharp Eyes" program, Chinese law enforcement is matching video images, social media activity, online purchases, travel records, and personal identity into a "police cloud." This integrated database enables authorities to keep track of criminals, potential law-breakers, and terrorists. If put differently, China has become the world's leading AI-powered surveillance state.

Transportation

Transportation represents an area where AI and machine learning are producing major innovations. Research by Cameron Kerry and Jack Karsten of the Brookings Institution has found that over \$80 billion was invested in autonomous vehicle technology between August 2014 and June 2017. Those investments include applications both for autonomous driving and the core technologies vital to that sector.

Autonomous vehicles—cars, trucks, buses, and drone delivery systems—use advanced technological capabilities. Those features include automated vehicle guidance and braking, lanechanging systems, the use of cameras and sensors for collision avoidance, the use of AI to analyse information in real time, and the use of high-performance computing and deep learning systems to adapt to new circumstances through detailed maps.

Light detection and ranging systems (LIDARs) and Al are key to navigation and collision avoidance. LIDAR systems combine light and radar instruments. They are mounted on the top of vehicles that use imaging in a 360-degree environment from a radar and light beams to measure the speed and distance of surrounding objects. Along with sensors placed on the front, sides, and back of the vehicle, these instruments provide information that keeps fast-moving cars and trucks in their own lane, helps them avoid other vehicles, applies brakes and steering when needed, and does so instantly so as to avoid accidents.

Since these cameras and sensors compile a huge amount of information and need to process it instantly to avoid the car in the next lane, autonomous vehicles require high-performance computing, advanced algorithms, and deep learning systems to adapt to new scenarios. This means that software is the key, not the physical car or truck itself. Advanced software enables cars to learn from the experiences of other vehicles on the road and adjust their guidance systems as weather, driving, or road conditions change.

Ride-sharing companies are very interested in autonomous vehicles. They see advantages in terms of customer service and labor productivity. All of the major ride-sharing companies are exploring driverless cars. The surge of car-sharing and taxi services—such as Uber and Lyft in the United States, Daimler's Mytaxi and Hailo service in Great Britain, and Didi Chuxing in China—demonstrate the opportunities of this transportation option. Uber recently signed an agreement to purchase 24,000 autonomous cars from Volvo for its ride-sharing service.

However, the ride-sharing firm suffered a setback in March 2018 when one of its autonomous vehicles in Arizona hit and killed a pedestrian. Uber and several auto manufacturers immediately suspended testing process and launched investigations into what went wrong, furthering the scope of how the fatality could have occurred. Both industry and consumers want reassurance that the technology is safe and able to deliver on its stated promises. Unless there are persuasive answers, this accident could slow Al advancements in the transportation sector.

Smart Cities

Metropolitan governments are using AI to improve urban service delivery. The Cincinnati Fire Department is using data analytics to optimize medical emergency responses. The new analytics system recommends to the dispatcher an appropriate response to a medical emergency call—whether a patient can be treated on-site or needs to be taken to the hospital-by taking into account several factors, such as the type of call, location, weather, and similar calls. Since it fields 80,000 requests each year, Cincinnati officials are deploying this technology to prioritize responses and determine the best ways to handle emergencies. They see AI as a way to deal with large volumes of data and figure out efficient ways of responding to public requests. Rather than address service issues in an ad hoc manner, authorities are trying to be proactive in how they provide urban services. Cincinnati is not alone. A number of metropolitan areas are adopting smart city applications that use AI to improve service delivery, environmental planning, resource management, energy utilization, and crime prevention, among other things. For its smart cities index, the magazine Fast Company ranked American locales and found Seattle, Boston, San Francisco, Washington, D.C., and New York City as the top adopters. Seattle, for example, has embraced sustainability and is using AI to manage energy usage and



resource management. Boston has launched a "City Hall To Go" that makes sure underserved communities receive needed public services. It also has deployed "cameras and inductive loops to manage traffic and acoustic sensors to identify gun shots." San Francisco has certified 203 buildings as meeting LEED sustainability standards.

Through these and other means, metropolitan areas are leading the country in the deployment of Al solutions. Indeed, according to a National League of Cities report, 66 percent of American cities are investing in smart city technology. Among the top applications noted in the report are "smart meters for utilities, intelligent traffic signals, e-governance applications, Wi-Fi kiosks, and radio frequency identification sensors in pavement."

Examples from a variety of sectors demonstrate how AI is transforming many walks of human existence. The increasing penetration of AI and autonomous devices into many aspects of life is altering basic operations and decision making within organizations, and improving efficiency and response times. At the same time, though, these developments raise important policy, regulatory, and ethical issues. For example, how should we promote data access? How do we guard against biased or unfair data used in algorithms? What types of ethical principles are introduced through software programming, and how transparent should designers be about their choices? What about questions of legal liability in cases where algorithms cause harm?

Improving Data Access

The United States should develop a data strategy that promotes innovation and consumer protection. Right now, there are no uniform standards in terms of data access, data sharing, or data protection. Almost all the data are proprietary in nature and not shared very broadly with the research community, and this limits innovation and system design. Al requires data to test and improve its learning capacity.

Without structured and unstructured data sets, it will be nearly impossible to gain the full benefits of artificial intelligence. In general, the research community needs better access to government and business data, although with appropriate safeguards to make sure researchers do not misuse data in the way Cambridge Analytica did with Facebook information. There is a variety of ways researchers could gain data access. One is through voluntary agreements with companies holding proprietary data. Facebook, for example, recently announced a partnership with Stanford economist Raj Chetty to use its social media data to explore inequality. As part of the arrangement, researchers were required to undergo background checks and could only access data from secured sites in order to protect user privacy and security.

Google has made available search results in aggregated form for researchers and the general public long back. Through its "Trends" site, scholars can analyze topics such as interest in Trump, views about democracy, and perspectives on the overall economy. That helps people track movements in public interest and identify topics that galvanize the public.

Twitter makes much of its tweets available to researchers through application programming interfaces, commonly referred to as APIs. These tools help people outside the company to build application software and make use of data from its social media platform. They can study patterns of social media communications and see how people are commenting on or reacting to current events. In some sectors where there is a discernible public benefit, governments can facilitate collaboration by building infrastructure that shares data. For example, the National Cancer Institute has pioneered a datasharing protocol where certified researchers can query health data it has using de-identified information drawn from clinical data, claims information, and drug therapies. That enables researchers to evaluate efficacy and effectiveness, and make recommendations regarding the best medical approaches, without compromising the privacy of individual patients.

There could be public-private data partnerships that combine government and business data sets to improve system performance. For example, cities could integrate information from ride-sharing services with its own material on social service locations, bus lines, mass transit, and highway congestion to improve transportation. That would help metropolitan areas deal with traffic tie-ups and assist in highway and mass transit planning. Some combination of these approaches would improve data access for researchers, the government, and the business community, without impinging on personal privacy. As noted by Ian Buck, the vice president of NVIDIA, "Data is the fuel that drives the AI engine. The federal government has access to vast sources of information. Opening access to that data will help us get insights that will transform the U.S. economy."Through its Data.gov portal, the federal government already has put over 230,000 data sets into the public domain, and this has propelled innovation and aided improvements in Al and data analytic technologies. The private sector also needs to facilitate research data access so that society can achieve the full benefits of artificial intelligence.





According to Greg Brockman, the co-founder of OpenAl, the U.S. federal government invests only \$1.1 billion in nonclassified Al technology, which is far lower than the amount being spent by China or other leading nations in this area of research. That shortfall is noteworthy because the economic payoffs of Al are substantial. In order to boost economic development and social innovation, federal officials need to increase investment in artificial intelligence and data analytics. Higher investment is likely to pay for itself many times over in economic and social benefits.

As AI applications accelerate across many sectors, it is vital that we reimagine our educational institutions for a world where Al will be ubiquitous and students need a different kind of training than they currently receive. Right now, many students do not receive instruction in the kinds of skills that will be needed in an Al-dominated landscape. For example, there currently are shortages of data scientists, computer scientists, engineers, coders, and platform developers. These are skills that are in short supply; unless our educational system generates more people with these capabilities, it will limit AI development. For these reasons, both state and federal governments have been investing in AI human capital. For example, in 2017, the National Science Foundation funded over 6,500 graduate students in computer-related fields and has launched several new initiatives designed to encourage data and computer science at all levels from pre-K to higher and continuing education. The goal is to build a larger pipeline of AI and data analytic personnel so that the United States can reap the full advantages of the knowledge revolution. One example of new ways to prepare students for a digital future is IBM's Teacher Advisor program, utilizing Watson's free online tools to help teachers bring the latest knowledge into the classroom.

They enable instructors to develop new lesson plans in STEM and non-STEM fields, find relevant instructional videos, and help students get the most out of the classroom. As such, they are precursors of new educational environments that need to be created. Federal officials need to think about how they deal with artificial intelligence. As noted previously, there are many issues ranging from the need for improved data access to addressing issues of bias and discrimination. It is vital that these and other concerns be considered so we gain the full benefits of this emerging technology. In order to move forward in this area, several members of Congress have introduced the "Future of Artificial Intelligence Act," a bill designed to establish broad policy and legal principles for AI. It proposes the secretary of commerce create a federal advisory committee on the development and implementation of artificial intelligence.

Conclusion :

The increasing penetration of AI into many aspects of life is altering decision making within organizations and improving efficiency. At the same time, though, these developments raise important policy, regulatory, and ethical issues. Now that we have seen all the pros and cons, what do you think about the state of AI? Where do we think it will take us?

We believe that what we do with this technology depends on us, people, largely, and especially on today's developers. If we would like to participate in creating a better version of our digital future, a job as a developer might be the right choice for us. In order to balance innovation with basic human values, we propose a number of recommendations for moving forward with AI. This includes improving data access, increasing government investment in AI, promoting AI workforce development, creating a federal advisory committee, engaging with state and local officials to ensure they enact effective policies, regulating broad objectives as opposed to specific algorithms, taking bias seriously as an AI issue, maintaining mechanisms for human control and oversight, and penalizing malicious behaviour and promoting cybersecurity.

But there also needs to be substantial changes in the process of learning itself. It is not just technical skills that are needed in an Al world but skills of critical reasoning, collaboration, design, visual display of information, and independent thinking, among others. Al will reconfigure how society and the economy operate, and there needs to be "big picture" thinking on what this will mean for ethics, governance, and societal impact. People will need the ability to think broadly about many questions and integrate knowledge from a number of different areas.

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INDIA PLANS MANUFACTURING INCENTIVE SCHEME FOR TOYS, LEATHER AND FOOTWEAR PRODUCTS



India is planning to broaden its Production-Linked Incentive (PLI) scheme to cover toys, footwear, and leather goods. This initiative is designed to boost domestic manufacturing, stimulate investment within these labour-intensive industries, foster job creation, and curtail dependence on imports.

Status of the proposed scheme

In line with the goal of maximizing the utilization of the INR 1.97 trillion (US\$23.70 billion) allocation for the Production Linked Incentive (PLI) scheme, the central government is poised to extend the scheme to encompass the toys, footwear, and leather sectors. Official sources from the Government of India have confirmed that Cabinet notes for both sectors are in an advanced stage of finalization.

The possibility of extending the PLI scheme to cover the manufacturing of train components is also under consideration. However, this proposal is currently in the discussion stage, as reported by various media outlets.

Initially, the Department for Promotion of Industry and Internal Trade (DPIIT) had planned an allocation of INR 35 billion (US\$421.05 million) for the PLI scheme for toys, while the footwear and leather sectors were slated to receive around INR 26 billion (US\$312.78 million).

However, numerous modifications have been introduced during inter-ministerial consultations, and the ultimate decision regarding the allocation will be made by the Prime Minister's Cabinet.

Performance of the Production Linked Incentive (PLI) scheme in India

The PLI scheme was introduced by Prime Minister Narendra Modi's government in 2020 to attract investments in 14 key sectors, deemed as sunrise and strategic sectors, with the aim of bolstering manufacturing and exports.

These sectors encompass automotive and auto components, electronics and IT hardware, telecom, pharmaceuticals, solar modules, textiles and apparel, white goods, drones and ACC batteries. Under the PLI scheme, incentives are based on incremental sales and are disbursed over a five-year period. In financial year (FY) 2022-23, incentives disbursed amounted to about INR 29 billion (US\$348.87 million), with expectations of reaching INR 130 billion (US\$1.56 billion) in the current fiscal year.

While some sectors, like large-scale electronics, pharmaceuticals, and food processing, have performed well, others, such as high-efficiency solar PV modules, ACC batteries, textile products, and specialty steel, have lagged behind. Although the disbursement is projected to increase in the next two years, significant savings are evident due to under-utilization in several sectors. The government intends to direct these savings to other critical sectors.

Boosting labour-intensive sectors through PLI expansion

The decision to extend the scheme to the toys, footwear, and leather sectors is rooted in their labour-intensive nature and the steps that have already been taken to make them appealing for investment.

A significant step taken in this direction was the introduction of a Quality Control Order (QCO) in 2020 for the toy industry. This mandate, enforced by the Bureau of Indian Standards (BIS) the following year, made it compulsory for toys to undergo certification. The primary aim was to curb the inflow of substandard toys through imports and simultaneously boost the domestic toy industry. Government estimates suggest that the combined effect of QCOs and increased import duties led to a substantial decrease of approximately 70 percent in toy imports, while exports witnessed a notable increase.

In a parallel initiative, the government has also instituted QCOs for 24 different products within the footwear sector, spanning both leather and non-leather categories.



Furthermore, the Indian government is actively exploring the prospect of introducing a PLI scheme tailored for train components. The objective is to reduce dependence on imports in this critical area.

Growth trajectory of India's toy industry

The Indian toy industry, comprising approximately 4,000 units from the MSME sector, constitutes around 0.5 percent of the global market share, with an estimated value of US\$1.5 billion. Despite its fragmented nature, the sector displays immense potential. A joint study by FICCI and KPMG anticipates that India's toy industry will witness a doubling of its value from US\$1 billion in 2019-20 to US\$2 billion by 2024-25. This growth projection outpaces the global average due to several pivotal factors.

The manufacturers primarily reside in key regions, such as the National Capital Region (NCR), Maharashtra, Karnataka, Tamil Nadu, and various clusters across central Indian states.

The Ministry of Commerce and Industry notes a significant decline in toy imports into India, plummeting from US\$304 million in 2018-19 to US\$36 million in 2021-22. Conversely, exports have witnessed a positive trajectory, escalating from US\$109 million in 2018-19 to reach a peak of US\$177.04 million in 2021-22, before declining by 13 percent to US\$153.88 million in 2022-23.

Factors driving the consumption of toys made in India

- **Domestic consumer base:** India boasts of a colossal population, presently standing at approximately 1.4 billion, constituting 17.7 percent of the global populace. In 2019, nearly 26.62 percent of the Indian population fell within the 0-14 age group, indicative of the substantial growth potential in the toy industry driven by its youthful demographics.
- Shifting preferences: Parental preferences are gradually evolving, with a notable inclination towards STEM-focused toys to foster science and math development in young children. This shift is steering consumers away from conventional toys in favour of modern, hi-tech electronic toys, reinforcing market growth.
- **Rise of online sales channels:** India has witnessed a surge in online sales channels, driven by the proliferation of smartphones and digital platforms. Online marketplaces

provide a forum for consumers to discuss product quality and features, while also enabling price comparisons. This digital shift has positioned online sales channels as one of the fastest-growing distribution avenues for toys in India.

- Rising disposable incomes: India has consistently demonstrated robust GDP growth over several years, positioning itself as one of the world's largest economies. This economic ascent has paralleled the expansion of the middle-class population, which has witnessed remarkable growth. On average, individual incomes in India have surged by 30 percent over the past six years. Consequently, consumers now have greater disposable incomes, influencing shifts in spending patterns towards innovative electronic toys, intelligent toys, and upmarket plush toys, gradually phasing out traditional and medium- to low-end battery-operated toys.
- **Global expansion:** The toy sector is increasingly expanding its global footprint, with manufacturers exploring new markets and increasing exports to regions, such as the Middle East and African countries. In recent developments, India has successfully finalized trade deals with key markets like the UAE and Australia. Indian-manufactured toys now benefit from the advantage of zero-duty market access via the India-UAE Comprehensive Economic Partnership Agreement (CEPA) and the India-Australia Economic Cooperation and Trade Agreement (ECTA).

Growth drivers for the Indian toy industry

- India's protectionist approach: To boost domestic production, India has raised basic customs duties on toys from 20 percent to 60 percent in 2020, and then to 70 percent on February 1, 2023. Simultaneously, stringent quality standards for imported toys have been enforced, limiting the availability of imported toys and stimulating demand for domestically produced toys.
- Access to raw materials: India is the world's second-largest producer of polyester and related fibers, contributing to an 8 percent global share in plush toy manufacturing, per an industry analyst. Competitive prices of key inputs like plastics, paperboards, and textiles favour local manufacturing.
- Location-based incentives: Indian states are offering critical incentives for the toy industry, which can subsidize





up to about 30 percent production costs. This is to attract investment and create jobs, but overall has been contributing to an emerging industrial ecosystem.

- **Cluster-based approach:** Over 60 toy clusters have been established by the Indian government. Standout examples include the 400-acre cluster by Aequs in Koppal, Karnataka, and the ongoing development of a 100-acre facility in Uttar Pradesh.
- Foreign investment rules: 100 percent foreign direct investment (FDI) is allowed under the automatic route for the toy industry.

Policies fuelling toy industry growth

- Promoting traditional toys: Initiatives like Toy Labs and toy fairs are being established to promote traditional Indianthemed toys, engaging both physical and digital realms for learning, play, and innovation.
- Cluster formation and skill enhancement: The government is forming toy producer clusters, upskilling artisans, and enabling their connection with foreign investors to enhance their engagement.
- Multi-sector collaboration: Various ministries, including Education, Textiles, I&B, Commerce, and others, are collaborating to enhance the toy industry's growth through diverse avenues, including skill development, technology integration, and cultural representation.
- Start-up engagement: The government has urged startups to explore the toy sector and support local manufacturing, reducing reliance on imports. Educational institutions are facilitating innovation in toy technology and design through hackathons.
- Quality certification mandate: Mandatory quality certification for toys ensures conformity to standards and fosters the growth of the indigenous toy industry.

Overview of India's leather and footwear industry

Leather industry

The leather industry holds a significant position in the Indian economy, not only as one of the top 10 foreign exchange earners

but also as a major player in various key aspects. India's vast cattle and buffalo population, accounting for 20 percent of the global total, and its goat and sheep population, contributing 11 percent, provide the country with abundant raw materials, thereby establishing a strong footing in the sector.

India is the second-largest exporter of leather garments, the third-largest exporter of saddlery and harnesses, and the fourth-largest exporter of leather goods globally. The footwear segment accounts for the majority of exports, with exports valued at US\$1.8 billion from April to August 2022. In the same period, the export of leather, leather products, and footwear reached US\$2.38 billion, reflecting a robust growth rate of 29.81 percent compared to the previous year.

India's leather industry accounts for approximately 13 percent of the world's leather production, with an impressive annual production of around three billion square feet of leather. The country also contributes nine percent to global footwear production. Notably, the sector is employment-intensive, offering livelihoods to over four million people, with a significant presence in marginalized sections of society. Women constitute around 30 percent of the workforce in the leather products industry, and the industry boasts one of the youngest workforces, with 55 percent of employees under the age of 35.

India as a footwear hub

India ranks as the second-largest producer and consumer of footwear worldwide. India's prowess in footwear production is remarkable, accounting for nine percent of the world's footwear production. The industry is projected to manufacture nearly 3 billion units by 2024, with an expected growth rate of eight percent CAGR. Per capita footwear consumption in India has risen from 1.7 pairs in 2016 to 2.3 pairs in 2021.

Non-leather footwear segment

The non-leather footwear market is a burgeoning segment in India, contributing approximately 90 percent to the total footwear market in 2021, with a market size of US\$4.3 billion. This segment is expected to reach US\$6 billion by 2024.

Key markets

Major markets for Indian leather and footwear products include the USA, Germany, the UK, Italy, France, Spain, the Netherlands, the UAE, China, Hong Kong, Belgium, and Poland.





Government initiatives

To bolster the leather industry, the Indian government has introduced the Indian Footwear and Leather Development Programme (IFLDP). This initiative focuses on developing infrastructure, increasing production, attracting investments, and generating employment within the leather industry. The government has allocated US\$220 million (INR 17 billion) until 2026 for this program. IFLDP encompasses six sub-schemes aimed at sustainability, diversification, infrastructure development, branding support, design, and technology advancement.

As India's leather industry continues to thrive, it remains a pivotal contributor to the nation's economy, fostering employment opportunities, boosting exports, and displaying a commitment to sustainability and innovation.

(India Briefing – 21/08/2023)

TAMIL NADU GOVERNMENT INKS PACT FOR RS 2,250 CRORE INVESTMENT IN LEATHER SEC-TOR, LAUNCHES STATE FOOTWEAR POLICY THE POLICY IS AIMED AT ATTRACTING RS 20,000 CRORE INVESTMENT IN THE LEATHER SECTOR BY 2025 AND IN CREATING EMPLOYMENT OP-PORTUNITIES TO 2 LAKH PEOPLE



The Tamil Nadu government signed five memoranda of understanding (MoUs) for an investment worth Rs 2,250 crore in the footwear and leather sector, on Tuesday in the presence of Chief Minister M K Stalin who unveiled the 'Tamil Nadu Footwear and Leather Products Policy 2022'.

The policy is aimed at attracting Rs 20,000 crore investment in the leather sector by 2025 and in creating employment opportunities to 2 lakh people. It would transform Tamil Nadu into the most favoured destination for manufacturing of footwear and leather products in Asia, he said and appealed to the industries to popularise 'Make In Tamil Nadu' products in a global arena.

"In order to achieve the USD 1 trillion economy by 2030, Tamil Nadu should attract capital intensive high-tech industries and employment intensive industries," he said while speaking at the Tamil Nadu Footwear and Leather Sector Conclave 2022 here.

KICL SEMS, Wagon International, KICL, Walkaroo and KICL (footwear cluster) are the five firms with which the state government signed the MoUs. These would generate jobs to 37,450 people.

Also, the Chief Minister laid the foundation stone for a Rs 400 crore mega footwear manufacturing park at Panapakkam, Ranipet, on the occasion.

Several global fashion brands have a connection to Tamil Nadu. Footwear of well-known luxury brands such as Louis Vuitton, Giorgio Armani, Gucci, Clarks, Cole Haan, Daniel Hechter, Bugatti, Prada, Zara, Coach, Tommy Hilfiger, Hush Puppies, Ecco, Johnston & Murphy, Hugo Boss, Pierre Cardin, and Florsheim, are either manufactured in Tamil Nadu or the raw materials are sourced from the state.

The state is the second largest economy in India, a leader in the traditional leather sector, and is championing the growth in footwear, it said.

"The state has a well-established industrial ecosystem of highperforming sectors such as electronics, textiles, information technology, auto-mobiles and auto-components," the policy document said.

Besides, the state offers a host of advantages in terms of human capital, knowledge and research, infrastructure, diversified economy, and favourable investment climate, it said.

The policy will increase the productivity of existing players and make Tamil Nadu the most favoured destination for footwear exporters.

Tamil Nadu has emerged as a natural leader in the footwear segment, contributing 26 per cent to the national manufacturing

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output and 48 per cent of the national exports. The existing footwear manufacturing clusters in Tamil Nadu can be leveraged to address the growing domestic demand and export requirements for footwear, the policy stated.

Apart from creating a conducive ecosystem and resilient supply chain for footwear manufacturing by supporting infrastructure in terms of clusters, parks and common facilities, the policy would enhance the non-leather footwear and component ecosystem by supporting the ancillary units besides encouraging exports.

Industries allied to footwear manufacturing or component industries located outside the clusters are eligible for a Fixed Capital Subsidy (FCS) of 10 per cent of investment in eligible fixed assets to be disbursed in 10 equal annual instalments.

The company can choose to avail FCS from the date of commercial production or upon achieving the minimum eligible investment threshold of Rs 150 crore and minimum employment threshold of 100 jobs, whichever is later, it said.

"The state accounts for a fairly large number of footwear and leather manufacturing units in India. Leather goods made in Tamil Nadu have great demand in the international market," the Chief Minister said while presiding over the event.

He said Tamil Nadu is the only state in the country to implement Zero Liquid Discharge in tanneries.

(The Indian Express - 24/08/2023)

EUROPEAN LEATHER COMPANIES EXPRESS INTEREST IN COLLABORATION WITH UZBEKISTAN



A delegation from Uzbekistan attended the SIMAC 2023 exhibition in Milan, focused on leather processing and footwear technology. During this event, Fahruddin Boboyev, the head of the association, held a series of negotiations with potential partners from Italy and Germany.

The guests met with Roberto Vago, the Managing Director of the National Association of Italian Footwear and Leather Goods Manufacturers (ASSOMAC). They discussed the entry of Uzbek suppliers onto the global stage and the launch of joint projects.

Italian companies have proposed allocating \$1.5mn to establish a technological center for the leather and footwear industry. This center will manufacture and service equipment for leather and textile enterprises.

It is expected that the new center will facilitate the organization of joint ventures with Italy. The Aldo Brué brand has already expressed its intention to start producing premium-class footwear in Uzbekistan.

Additionally, representatives of "Uzcharmsanoat" held several meetings with the Federal Association of the German Footwear and Leather Industry at the event. Both parties agreed to create a special program to attract German brands to Uzbekistan.

In October, a delegation from six leading German companies will visit the country. It is anticipated that its members will familiarize themselves with local production and establish agreements with local companies.

(https://daryo.uz/ - 25/09/2023)

THE 5TH SUSTAINABLE LEATHER FORUM WAS HELD



News Corner _____



At the Sustainable Leather Forum, which was held for the fifth time this year at the Palais Brongniart in Paris on Monday, September 11, Social Responsibility principles organized by the French Leather Industry were presented as the main topics of fashion and traceability in the sessions with speakers from the industry.

The conference, which turned into an international organization, took place in 4 sessions. Frank BOEHLY, president of the French international leather council, made the opening speech and included the solutions and sustainability of the problems under the guest speakers and the determined main headings on their agenda.

In the first session, certification standards and traceability processes in the leather industry were discussed. Gustavo Gonzales Quijano, secretary general of the national tanners' confederation of the European community (COTANCE), gave examples of improvement in process quality upon the implementation of various certifications of all stakeholders in the supply chain, covering Corporate Social Responsibility. "It's about providing information to consumers to communicate between consumers and brands," said Katie KUTSKILL, technical lead at the Sustainable Leather Foundation.

As a speaker on the theme of expectations and solutions on Agriculture and Climate Change, Paul LUU emphasized the place of agriculture in the leather industry and emphasized that "There should be a transition from traditional agriculture to ecological and bio-dynamic agriculture".

At a time when the limits of traditional agriculture were presented at COP21 and were recently addressed in European climate policies, the importance of new approaches such as regenerative agriculture in agriculture and especially in animal husbandry was highlighted, and the traceability of meat products was also brought to the agenda.

In the third session, Pierre MISCHEL, among the speakers in the Personal protective equipment sectors, protective shoes and protective gloves sectors, underlined that "Innovations and investments should attract attention".

In the fourth session, Circular fashion, our professions have always been included in the circular economy; first with leather, which is an upcycled material for the first time, and then with shoes and leather goods, which are often designed to be both maintained and repaired. In addition to maintenance and repair, the durability and environmental impact of materials and products are essential conditions for the successful implementation of the circular economy.

Speaker Nienke STEEN talked about the impact of the circular economy and said, "Circular economy is beneficial to human health and the environment." It was emphasized that "the sustainability of products is an important part of their connection with repairability, and since they can monitor the formation process of the product, they can also measure its impact on the environment."

Networking was created through the launch of an international matchmaking platform, allowing them to follow the conference remotely via live broadcast and personalized access. In addition to the speeches, the conference also included B2B meetings.

(https://www.magazineleather.com/ - 12/09/2023)





Valorisation of Invasive Species -For Leather, Fur, Bristle, Meat and By-Products

(Part-9)

Subrata Das, M.Tech (Leather Technology)

Freelance Leather Technologist & Consultant, Chennai





Ranging throughout Central and South America, from Southern Mexico to Northern Argentina, across eighteen nations, out of thirty-three, which comprise Latin America and the Caribbean (except Mexico), spectacled caiman is the most abounding of all 25 of the crocodilian species. The carnivorous saurian live in freshwater wet land habitats and flooded grasslands, crisscrossed by slow moving rivers or lakes. They are confirmed as an invasive species in Puerto Rico, Cuba and Florida. (1)

Puerto Rico

Caimans are widespread across Puerto Rico, particularly along its northern coastal plains. The island's largest numbers are in Tortuguero Lagoon Natural Reserve (TNLR), Vega Baja, spilling over into the San Juan Bay Estuary and beyond, to the island of Vieques. The scaled reptiles were first liberated in the 1960s and 70s in Puerto Rico, by the multinational retail chain Woolworth's, a leading player in the pet trade, making capital of

Corresponding author E-mail : katasraj@rediffmail.com

Spectacled Caiman



lax regulations, to sell eft sized caiman juveniles and sub adults to hobbyists.

The release of the semi-aquatic ectotherms was presumably done, based on three considerations :-

Firstly, the Caribbean island enjoyed salubrious tropical weather, with temperatures ranging between 21-29 degrees Celsius and an extended rainy season, stretching from April to November each year - in every way, like in the alligatoroid's native range.

Secondly, with the island being neither a sovereign state, nor a US state, there were no procedural hurdles, in those days, or labyrinthine requirements of paperwork to transport the reptiles, by a 2h 30m flight to Miami.

Thirdly, the agreeable and wholesome weather was expected to encourage the free-ranging, non-captive carnivores to



flourish along edges of riparian and littoral regions, feeding on aquatic, terrestrial or aerial life, multiplying unhindered, with no associated overhead or husbandry cost liability.

Initially enamoured, the impetuous and impulsive buyers, both experienced and dilettante, spent extended hours, hand feeding their "caiman companions", with beetles, grasshoppers and crickets, while observing them practice the 'minimum exposure' pensile posture , with nostrils, eyes, ears and top of the head above water level. As the reptiles grew in edacity, immensity, bellicosity, abstrusity and hideosity, their caregivers, out of frustration, lack of commitment or economic compulsion, opted for the easiest course of action. The cold-blooded, bony-plated lacertilians, were dumped in the nearest swamp or wetland, to fend for themselves.

Today it is estimated that 1000 caimans live in Puerto Rico. Their predominant numbers, are in and around the flood prone Rio Cibuco, which flows through the municipality of Vega Baja.

In its epicentre, the Tortuguero Lagoon Natural Reserve (TLNR), designated as a Nature Reserve in 1971, and managed by the Department of Natural and Environmental Research (DNER), the apex predator subsists on an omni-carnivorous diet. The 1.2m deep lagoon, with maximum storage capacity of 2.68 million m³ of water is located between the municipalities of Manati and Vega Baja. It is the largest freshwater reservoir in Puerto Rico spread over a surface area of 2.43 km².

The water body is girdled by hills, coastal shrubs, marshes and swamps, abundant in avifauna such as, mammals, 23 fish species, native reptiles, and amphibians and 83 species of birds, proffering multitudinous and nourishing food sources for the resident caimans. The opportunistic omni-carnivorous species devours a wide array of invertebrates (giant water bugs, soldier flies, scarab beetles), fish (spine cheek gudgeons, tilapias), aquatic gastropods (trumpet snails, quilted melania), crustaceans (freshwater prawns and shrimps), arachnids (nursery web spiders), amphibians (American bullfrogs), reptiles (red-eared- and central Antillean sliders), birds (jungle fowl, American purple gallinule), and even mammals (house mice). Less commonly known, part of their diet may include plant material such as seeds, leaves, or even fruits and inedible waste (glass, rubber, metal, plastic material and urban refuse).

North-eastern Caribbean - Puerto Rico, Dominica and Saint Croix were pummelled and pulverized by the devastating Category 5 Hurricane - hurricane Maria, on September 20, 2017. Rio Cibuco and Rio Grande de Manati, were breached at multiple locations, causing flooding of low-lying areas. The fourth most expensive Tropical cyclone, not only caused a major humanitarian crisis, but also an ecological one by sweeping many invasive spectacled caiman, in the floodwaters, into the island's hinterland.

Cuban Archipelago

Isla de la Juventud (the Isle of Youth) is Cuba's remote nature paradise, lying directly south of the island- country's capital Havana, in the Caribbean Sea.

In the 1950s, nine spectacled caiman, imported from Colombia to Cuba, were introduced into the Lanier swamp, "the Isle of Youth " – the seventh largest island in the West Indies- to be raised for their exotic skin and meat. The venture was also influenced by the desire of the Cuban government, to replenish stocks, imperilled by the precipitous decline of the native Cuban crocodile population, due to reckless commercial exploitation and hunting.

Between October, 17-21, 1959, Tropical Storm Judith, which developed in the Straits of Yucatan between Mexico and Cuba, brought heavy squalls accompanied by heavy rain and wind speeds of 50-80 kmph, to most of the western Caribbean, including the Isla de la Juventud. Severity of the downpour caused extensive flooding, facilitating the escape of the nonnative alligatoroids, from their enclosures in the Fluvial Repopulation Centre El Digue, in Havana. The reptiles made their way through the deluge and dispersed to areas, ideal for survival and reproduction.

By the early 1990s, the non- indigenous spectacled caiman had established well in the favourable conditions and increased markedly in numbers, outcompeting the Cuban crocodile both for food and habitat, placing further survival burden on the smaller species.

Found across the wetlands, sewers, drains, ditches, dams and rivers of the island, in greater abundance eastern and northern peripheries of Lanier Swamp, a small wetland of approximately 100 km² situated on a west-east axis, across the island's centre, the spectacled caiman is widely distributed all over the 2200 sq km contiguous area of land, totally surrounded by water. Several



of the amphibious juggernauts have been sighted in and around Punta del Este, Laguna Redonda and Laguna Grande.

In the introduced range in Cuba, the interlopers are in competition with two congeners – the Cuban crocodile and the American crocodile for endemic aquatic and ground nesting birds, smaller reptiles, molluscs, crustaceans and fish such as the Cuban gar.

Another negative impact of the invasive spectacled caiman on the endangered Cuban crocodiles, which has alarmed scientists, is the discovery of their hatchlings in the stomach contents of adults of the former. This is particularly concerning, in view of the lower fecundity (2-33 eggs/nest) of Cuban crocodile, and a 50% rate of success of hatching, as compared to the spectacled caiman's 100 eggs/nest, which have a 95% possibility of hatching successfully.

USA

In the 1950s, juveniles began to bought, sold, traded and offered as exotic pets. Suddenly acquiring and possessing a crocodile, alligator or caiman, assumed great snob value appeal, with a certain natural and invariable cachet.

Soon thereafter "baby alligators" as juvenile spectacled caimans were called in the US, began to be forsaken and tossed into canals in and around Miami, where in the absence of predatory threat, they established dominance over a large area, from Florida City in Dade county, to Lake Jessup in Seminole county.

The largest confirmed breeding population in Florida is at Homestead Air Force Base, where successful naturalisation has occurred over more than three decades. Breeding adults, juveniles and hatchlings have been observed in Ft. Lauderdale, Broward County as well as in western Dade county. Intriguingly, there are no established and breeding populations of spectacled caiman in the Everglades - which has many exotic invaders, living in its swamps and tropical wetlands. How it would succeed and survive against Burmese pythons, Nile monitors, Argentinean black and white tegu lizards and American alligators, remains unknown.

Sightings of caiman escapees, accidental drifters and abandonees have been reported as of date from 16 states -Arizona, California, Connecticut, Lowa, Indiana, Kansas, Maryland, Massachusetts, Minnesota, Missouri, New York, Oklahoma, Pennsylvania, Virginia, Tennessee and Washington - many regions outside of the caiman's thermal tolerance of 12 -15 degrees Celsius. It is though that the saurian have access to warm effluents , in these areas, due to which they have been observed migrating.

Scientists believe these to be an under-representation of the total numbers across the US, as many cases go unreported.

Spectacled caimans in the US exemplify, an introduced species flourishing in a new bio region, hundreds of kilometres outside their natural range.

According to "Exotic Amphibians and Reptiles of the United States" by Walter E. Meshaka, Suzanne L. Collins, R. Bruce Bury, and Malcolm L. McCallum, among 103 species of invasive herpetofauna in Hawaii and Continental US, spectacled caiman, the sole crocodilian representative is naturalized in four or more locations.

Colombia (San Andres Island)

Located 750 km north of the mainland , in the Colombian Caribbean, San Andres island, politically a part of the department of San Andrés, Providencia and Santa Catalina, Colombia, is a renowned biosphere reserve. Among some species which enrich the diversity of its ecosystem, are spectacled caimans, an unspecified number of which were intentionally introduced to the habitat in 1976. The lacertilians gained near immediate traction in four perennial freshwater lagoons on the island - Jack Pond, Small Pond, Manuel Pond and Big Pond, also known as Lake La Loma (from smallest to largest). Released initially into the biggest water body, the scaled carnivores, rapidly established their sway over the other three.

Out of eighteen faunal species inhabiting the island ,the spectacled caiman is one among seven non -native faunal species incorporated accidentally or deliberately into the bioregion - its contemporaneous interlopers being the Rio Magdalena tegu, gold tegu, red-footed tortoise, green iguana, black spiny -tailed iguana and yellow headed geckos.

The quartet of lagoons, in which the caimans inhabit, is surrounded by herbaceous plants, shrubs and wide varieties of terrestrial and aquatic vegetation.

The predatory, generalist, San Andres caimans feed on infinite supplies of diving beetles, which swim, fly and crawl in the



area, fish, native birds, crabs, turtles, grasshoppers and crickets, gastroliths, seeds and berries, sundry plant material, centipedes and millipedes. Although no attack on humans have been reported till date, residents and tourists are fearful of venturing for a swim into the inviting waters of the lagoon.

Though originally non-native, the alligatoroids, after colonizing the four lagoons of San Andres for six decades, constitute an inseparable part of the island's fauna.

There has been no concerted attempt by the islanders to exploit the reptile numbers for commercial gains, except sporadic instances of sale of caiman skull and jawbones as tourist souvenirs. The animals are more popular as tourist attractions, with community members inhabiting lagoon side villages chaperoning tourists for photographing the conic caimans and recounting the history of their pathway to San Andres.

Latin America has the highest wealth of crocodilians species that can be in any comparable area in the world; twelve taxa (including subspecies), are distributed from Mexico to the Argentina. The vast geographical area gives the wetlands and immense riverside systems, an extensive, near unbroken habitat for caimans and crocodiles.

With the largest distribution and range of any New World crocodilian, the spectacled caiman, also known as the speckled, white - or common - caiman is extant in Belize, Bolivia, Brazil, Colombia, Costa Rica, Ecuador, El Salvador, French Guiana, Guatemala, Guyana, Honduras, Mexico, Nicaragua, Panama, Peru, Suriname, Trinidad and Tobago and Venezuela.

Since the first-ever regularly scheduled commercial jetliner transatlantic crossing, between London Heathrow and, New York International Airport, Anderson Field, known commonly as "Idlewild", (subsequently renamed John F. Kennedy International Airport, on December 24, 1963), on October 4th, 1958, by a British Overseas Aircraft Corporation (BOAC) de Havilland DH 106 Comet, reduced travel time from five days on an ocean liner to seven hours, people were enthused to travel to and vacation in exotic lands. In the 1970s, jet aircraft commenced carrying more and more passengers. Increased profits made flights cheaper and affordable to the American middle class with disposable income.(2)

During this period, Florida experienced an unprecedented tourist boom. With the economy prospering again, disposable income of post-war middle-class Americans empowered them to voyage for pastime and vacations as never before.

As mementos of their visits, American travellers returned home with knick-knacks and mass-produced merchandise such as caps, scarves, T-shirts and clothing; collectables: postcards, mugs, coasters, dolls refrigerator magnets, souvenir coins ,miniature bells and figurines. In those halcyon days, when there was no legal prohibition to do so, some tourists returned with unusual and striking birds and animals, among them baby crocodiles and caimans.

Because crocodiles and caimans can grow to unmanageable sizes, it was inevitable that some Irresponsible owners would release the reptiles into the wild. Accustomed to a pampered, sedentary lifestyle due to constant human care and attention, the lacertilians had little or no survival skills. While a few perished due to road kill, others died from starvation or exhaustion or were eaten by other carnivores.

A few of these crocodilians ,however managed to establish dominance, in their non-native ecosystem, and initiate breeding with other discards, abandonees or escapees of their kind. In due course, bolstered by strength of their numbers, they colonized areas, which they found salubrious, competed for food and resources with native species and in many cases, being generalist carnivores, preyed on them, devastating the hitherto balanced ecosystem and becoming safety hazards to humans, their companion animals and livestock.

By 1960, when legal enforcements were initiated, at both the federal and state level, to first control and then to completely prohibit the trade in crocodilian hatchlings and juveniles, pet traders stated importing sub-adult and juvenile Spectacled Caimans from Central America. In the decade between 1960 -70, thousands of these imported, relatively small saurian, often sold as "Alligators" or "Dwarf Alligators", to uninformed buyers, entered the US.

Four additional subspecies were introduced into Florida since the 1960s: the Slender-Snouted, Cuvier's Dwarf Caiman, Schneider's Smooth-Fronted Caiman and Spectacled Caiman. Only the Spectacled has established a lasting presence. No stable populations of the other species are known to exist in the wild.

With the propensity to grow between 4 and 8 feet, from snout to tail, and attain weights of 7-40kgs dilettante pet owners,



lacking long term commitment and interest , unburdened themselves by setting the armoured reptiles free in riverine or swampy areas. While many perished in weather, inclement for their growth and multiplication, the tropical climate of South Florida – warm , wet summers and mild dry winters was salubrious for the wellness of the caimans.

By 1968, Spectacled Caiman nests were regularly sighted in Dade County, substantiating that a breeding population had already been established. By 1974, the number of Caimans in Florida had swollen significantly, to unnerve wildlife officials, who initiated a program to rid them from the swamp and wetlands around Homestead Air Force Base. The failed endeavour, in addition to several other unfruitful attempts elsewhere did little to halt the spread of the saurian. Herpetofauna invasion of the Sunshine state reached a crescendo with Hurricane Andrew, in 1992. The category 5 Atlantic storm, with violent winds of 165 mph, made landfall near Elliot Key and Homestead on August 24, demolished a number of amphibian, fish and reptile farming and breeding facilities to liberate a number of exotic species, including Spectacled Caiman, into the wild.

Today, there are breeding floats and basks of the creatures in Dade and Broward Counties, and non-breeding numbers have been reported from as far north as Palm Beach and Seminole Counties. In addition, breeding numbers have become established in Puerto Rico and in Cuba (where the Caiman is a competitor with the endangered Cuban Crocodile). Isolated escapees, singly or in limited numbers, have been reported all over the US. However, the favourable weather of Southern Florida, similar to that in their native ranges, provided the ideal conditions for breeding populations to settle into.

The Spectacled Caiman is so called, because of a curved ridge of bone fronting the eyes, creating the impression of being spectacled.

The unaggressive, timid and shy crocodilians have been found to average between five and six feet in Southern Florida. They rarely attack people, and if so, solely in self-defence. Caiman bites to humans result in multiple lacerations, interarticular fracture, infection and trauma.(3)

The generalist, opportunistic predator, devours aquatic birds to crabs, fish to large insects and snails to turtles. Bigger individuals possess the stealth and strength to overwhelm smaller feral pigs and other mammals which come down the water bodies to drink. By carrying the parasitic tongue worms, which are released into the water, spectacled caiman infects native species of fish.

Upon attaining sexual maturity between ages four to seven, pregnant females construct nests near water, from putrefying leaves and vegetation to lay 30-35 leathery eggs. During the incubation period, the female dwells in the vicinity, protecting them from predators such as foxes, herons and ovivorous lizards. Upon hatching, with help from the mother, the hatchlings extricate themselves from the nest and head for the water. Since they are easily hunted and eaten by raccoons, turtles and egrets, the hatchlings remain under the mother's invigilation and supervision, for several months, till they can fend for themselves.

Because most of their skin is studded with bony plates, called ventral osteoderms, spectacled Caimans are not valued very much for their leather. Like all crocodilians, however, they are legally protected and their international trade is regulated. In most areas of South and Central America, Spectacled Caimans are not considered to be seriously endangered, though the Colombian populations are threatened.

Spectacled Caimans, like other crocodilians are endowed with tough epidermal scales consisting of bony plates and keratin for added protection. The scales are unusual, on the head, because they are visible in the afterm ath of cracking of the hardened skin, rather than their shape being genetically determined.

These scales have "micro-organ" like sensors known as dome pressure receptors (DPR) or Integumentary chemo, thermoand mechano-sensory organs, which equip the saurian to perceive chemical stimuli, surface pressure waves to detect prey in crepuscular and nocturnal conditions, changes in temperature conditions from heat to cold and vice versa and chemical stimuli. The receptor channels also impart to the Spectacled Caiman, the faculty of thermoregulation. This attribute is unmatched in any other vertebrate, except the Nile crocodile. (4)

Because most of their armoured but sensitive skin is shielded with bony plates, called ventral osteoderms, Spectacled Caimans were not much sought after for their leather, in the early days of reptile skin trading. Subsequently with innovations in application technology and process development in reptile



tanneries, and depletion of crocodile numbers, Spectacled Caimans were rampantly hunted in their native ranges, primarily for leather. Colombia was the major exporter of skins, totalling in excess of six million in two decades (1996 -2015), culminating in a severely threatened status in the Andean Republic.

The commercial quality of both American alligator and crocodile skins are considered superior to caiman skins, in the exotic leather trade. Usually only the flanks of larger crocodilians, which have smooth, symmetrical, rectangular tiled shaped scales are used. It was only in the 1950s, that commercial exploitation of caiman skins, commenced, actuated by the diminishing numbers of alligators and crocodiles due to overhunting. In the preceding years, caimans were of now interest to skin traders because of the low value that their skins fetched.

In the last seven decades, millions of caiman skins, harvest from the Americas, have served the demand of for exotic skins by the leather industry. Today CITES regulated annual production of caiman skins exceeds one million.

With slaughter being largely confined to large adult males, the species has withstood the pressure of sustained commercial hunting.

The resilience and resistance of the species to commercial harvesting, coupled with its wide distribution and adaptability, makes it amenable to "cropping" or manual reduction of numbers, by targeting larger males, to ensure that the species multiplies at a regulated and acceptable rate.(5) Like all crocodilians, however, they are legally protected and their international trade is regulated.

Poaching of the reptile for meat, and skins, is rife throughout the Brazilian Amazonia since 1980s but in only one locality is known where a the population is in danger due to subsistence hunting undertaken by indigenous people in the north of Amapa state - the second least populated in Brazil.(6)

In the decade between 1980-90, the export of four species of Caiman skins (Spectacled caiman, Brown Caiman, Yacare Caiman and Rio Apaporis Caiman, were chiefly from Bolivia, Colombia, Guyana and Venezuela. Later a high volume of illegal international trade in skins of Spectacled Caimans spiralled from Nicaragua, Honduras, Brazil and Paraguay – countries which had prohibited exports. At present the US accounts for only 4-6% of the total declared skins of the Spectacled Caiman. This is surprising, in view of its exceptionally strong links South and Central America and the fact that it is the dominant market for Tegu lizard skins – the other dominant South American reptile in the skin trade. This may be explained by the perception that the spectacled caiman skin trade competes with the Mississippi skin industry.(7)

Today, it is not exactly known, exactly how many Spectacled caiman reside in the swamplands of South Florida, and their annual rate of growth. Since Caimans are weather sensitive, they have thus far been confined to the furthest south of Florida and do not appear to be expanding their habitat. Consequently, state wildlife officials have accorded it low priority, especially since the programme to eliminate the species in Homestead Air Base area was a failure.

A specialized group of marine biologists, affectionately called , the Croc Docs , have been tasked by Floridian federal authorities of keeping the Spectacled caiman numbers in check. By employing drones to locate nesting caimans, so they can remove and destroy the eggs, the scientists strive catching young adults before they reach sexual maturity and commence breeding. As of May 2021, the team had manually caught or captured 240 individuals and euthanized them humanely. (8)

The University of Florida, through the efforts of the Croc Docs, collaborates with Florida Fish and Wildlife Conservation Commission and South Florida Water Management District on action plans and endeavours to curb, contain and lower core populations, as well as avert caiman numbers from spreading into new areas. They aim to monitor trends in the caiman population and determine impacts on native wildlife by: Conducting weekly surveys and removal where caiman populations exist, rapidly respond to reported caiman sightings, perform necropsies and diet analysis, calculate encounter rates and occupancy for caiman and native crocodilians in response to caiman removal and improve scientific understanding and public awareness.(9)

As long as they stay at a low density and do not adversely impact the native American alligator and Crocodile populations, Florida seems content to just observe and confine the invasive Spectacled Caimans to a small area.

Apart from its perpetual value in the leather industry for the manufacture of footwear, garments and accessories of beauty



and quality, lacertilian flesh has a long history of use in many countries both as a sustenance food and as pet protein. In recent times, the saurian meat, sold for \$50 -70 a pound, has gained popularity among experimental eaters, not only for its organoleptic value, but also for its nutritional composition – the iron content of crocodile blood being comparable to duck, chicken and swine blood.

Crocodile blood has been used in many traditions of the Americas, Africa and Asia for therapeutic, curative and palliative care and symptom management of patients by shamans, witch doctors, medicine men and traditional healers, for a wide range of maladies ranging from aches and pains, wound healing, hypertension, fever and skin ailments, muscle soreness, as well as for allergy, asthma and gout, as well as for addressing symptoms associated with HIV.

Crocodile blood has been sold as a dietary supplement since 2008, as it has been proven to possess anti-inflammatory, antioxidant, antibacterial, antiviral, anti-oxidative, anti-tumour and anti-anaemia properties. It has also been valorized in the manufacture of cosmetics, skin care products and tonic medicines.

Crocodile blood (CB) products, of potency below 1g per day as a dietary has been endorsed by The Thailand food and drug administration (FDA).

As many as 21 organs and products of crocodiles are used for human consumption and medicinal applications in West and central Africa. These are gallstones, bezoars, testes, cloaca, heart, lungs, liver, gall bladder, bile, kidney, teeth, dropping, blood, egg shell, eggs, fat, bones, claws, jawbone, muzzle and skin.

Crocodilian phalli are valued as both oral and ornamental aphrodisiacs, while necklaces, bracelets and other jewellery are made from the reptile's teeth. Sometimes pieces of crocodile bone and teeth are made into amulets, to endow the wearer with protection, amelioration and magical powers. Additionally, these guarded the wearer from bad influences, pestilences, misfortunes and accidents and imparted wealth and prosperity, fertility, health and welfare in trade and business.

Although caimans and crocodiles, both belong to the same order – Crocodilia but to different families – alligatoridae for the former and crocodylidae for the latter, the blood and body parts of both apex predators could be used for identical applications. Exotic boots, stitched from caiman bellies form part of a signature product line from Austin, Texas, based Tecovas. When expanded over the vamp, caiman skins offer greater and optically pleasing, symmetry of pattern , than alligator or crocodile skin, lending more consistency and uniformity to the final footwear. The caiman boots, which carry price tags, double that of traditional ones, are fully handmade in the company's factory in Leon, Mexico. They come in two styles – a cowboy boot labelled The Dillon and a roper boot titled The Cole – both priced at \$445. The models, offered in sizes 7 through 14, in two colours-chocolate and midnight blue, feature Goodyear welts, hand pegged soles and hand sewing on the shafts.

Another caiman offer from a reputed supplier is the Caiman Horseman Boot, with giant belly caiman vamp, costing \$995.

For the USA, grappling with invasive caiman management, although the natural and initial focus on skins being the primary product, with lateral thinking, innovativeness and investment of time, effort and finance, caiman by products can become valuable and in turn boost profitability.

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This article was originaly published in Vol.- 34 No.- 05 May' 1986 issue of JILTA.

SCIENCE & TECHNOLOGY

Pigments and their Excellence

By SANJAY CHAKRABORTY College of Leather Technology, Calcutta

NTERACTION of the pigment surface with the medium is of utmost importance because most of the important properties of finished fi'ms and finishing season are associated with the chemical and physical conditions of the pigment/vchicle interface, or broadly pigment/ liquid interface. The establishment of this contact between pigment and vchicle is hence one of the most important operations in pigment manufacture.

A most important feature of the pigment/liquid interface should therefore form the starting point of discussion of the topic on surface properties.

Importance of thorough wetting :

For the manufacture of a pigmented paste it is usual to start with the pigment in the form of a tiny discrete powder when the pores and interstices on the surface of the particles are adsorbed with air or moisture. So in the dry powder form the boundary of the pigment particles contain a solid/air interface. But when pigment is used in the substrate it contains a solid/liquid interface. This change of interface is of significant importance. Here the liquid is vehicle or medium in which pigment remains dispersed. This interface, its physical and chemical properties controls the most important properties of the pigmented films. During the change of the adsorbed layer many a times it happens that there are residual air bubbles at the interface on account of incomplete and inefficient phase displacement which is known as wetting. These points of weakness may set up strains in the film which can lead to cracking or other forms of premature break down. Therefore it is to be taken into consideration that every individual pigment surface be wetted and there should have an uniform vehicle layer surrounding each of the particles, otherwise the colour, gloss, hiding power, settling on storage and mechanical properties of the film are largely affected.

The distribution of vehicle among the individual pigment parcticle is of utmost importance to facilitate dispersion of pigments in the season. Auglomerate formation and moisture adsorption during grinding :

This wetting process needs a careful control because the pigment particles do not tend to be wetted and dispersed by its own in the medium. When these are broken into tiny sizes, during grinding, the surface area of pigment lumps increases tremendously for a given weight. Since all surfaces have a free, energy, content, the available free surface energy of ground pigment powder is much greater than that of a corresponding weight of pigment lumps because of the greater surface area of the former. The ratio of surface energy to mass is very small in the pigment before grinding operation but the same ratio increases its value tremendously after grinding operation. But according to the thermodynamic reasons, any process leading to the diminution in surface area and therefore surface energy will proceed without the necessity for provision of energy i.e., spontaneously. This is why, the particles adhere strongly during grinding and form agglomerates. These particles also absorb moisture or air from the atmosphere in the same operation because by that means they tend to decrease their free energy. So adsorption of moisture or formation of hard agglomerates during grinding operation is spontaneous and natural.

The same thing happens during the various processes involved in the production of pigments e.g., precipitation, drying, calcination etc. will thus tend

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spontaneously to form large agglomerates with a consequent reduction in surface area. Therefore thorough wetting of pigment particles involve efficient mechanical work.

Definition of Surface Tension :

This tendency to diminish surface area is a law of nature and is exhibited both by liquids and solids. By such diminution of surface area an unbalance is created in the cohesive forces of the molecule at the boundary as a result of which the surface of any liquid or solid is always under tension which goes by the name of surface tension.

It is generally believed that the surface tension of solids is much greater than that of liquids but of course it is not so much strong as to change the shape of solid materials.

What should be the prerequisite to wet a solid surface by a liquid phase :

The tendency of a liquid A to wet another liquid phase B i.e., to mix with each other their difference of surface tension is most important. It may be reearded as Interfacial Tension.

. YAB = YA - YB

The smaller the difference, the greater is the wetting, i.e., miscibility of two liquids.

But this is not the case for wetting a solid surface by a liquid phase and the wetting phenomenon is assessed here by reference to an squation due to Dupre'.

 $W_{SL} = \gamma_S + \gamma_L - \gamma_{SL}$ (1) Here, $W_{SL} =$ work of adhesjon, i.e., energy required to

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adhere a liquid on a solid surface. It is defined as the difference of free surface energy present in the system before and after the wetting process. To have a spontaneous wetting W_{SL} must be positive, but if it is negative, energy must be supplied from outside to have a wet surface.

- 75 Surface tension of solid
- 7L-Surface tension of liquid
- yst -Interfacial tension be
 - tween solid and liquid.-

The same equation is applicable also for two inmiscible liquids. So when both liquids are identical, $\gamma_S = \gamma_L$ and there should have no interfacial tension, i.e., $\gamma^{SL} = 0$.

As the two liquids are identical, the work of adhesion is equal to the work of cohesion (W_C) .

. WSL = WC = 27L

This aspect of wetting is not sufficient for the wetting of pigment surface. For the effective wetting of pigment surface by the medium three aspects of wetting are to be taken into consideration.

Different aspects of Wetting :

- The medium must adhere to the pigment surface,
- It must spread over the same,
- It must penetrate into the pores and interstices of individual pigment particles by which traces of air adsorbed on the pores may come out.

So, the liquid must spread secondly on the pigment surface If the cohesive forces between the liquid molecules is greater than the attraction between them and solid surface, they will not wet and spread over the surface. So the reverse condition is necessary for spreading and the work needed for spreading is known as the spreading co-efficient W_S .

$$W_{S} = W_{a} - W_{C}$$
$$= y_{S} + y_{L} - y_{SL} - 2y_{L}$$
$$= y_{S} - (y_{L} + y_{SL})$$

In considering penetration it is seen that the liquid penetrates through the pores and interstices of pigment surface only with the following conditions :

 $W_P = \gamma_S - \gamma_{SL}$ (III)

... (II)

Here, W_P is the work required to penetrate the liquid in the pores. It is the difference of total free surface energy of the liquid before and after penetration. For spontaneous penetration of liquid 'W_P must be positive.

Functions and Uses of Wetting . Agents :

To facilitate effective wetting, thus for effective dispersion and to reduce the tendency of aggregation, it is usual to employ special additives, the wetting agents, known as surface active agents during grinding. These wetting agents reduce the interfacial tension of the pigment/ liquid interface by being adsorbed at the pigment surface and because of their high degree of activity in this respect, quite small amounts may modify the nature of the pigment surface very considerably.

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These wetting agents contain distinct hydrophilic and lipophilic portions which orient themselves in such a way that the hydrophilic portions point towards water and hydrophobic portions point towards solid or air. As a result of which solid/liquid interface is changed to Solid/Wetting Agent and Wetting Agent/liquid interface by means of which solid/ liquid interface is reduced to a large extent.

From the previous three equations it is found that reduction of γ_{SL} helps all the terms W_{SL} , W_S and W_P to be increasingly positive consequently facilitating all the three aspects of wetting.

Another aspect of the use of wetting agent is to make the dispersed phase stable by restricting the tendency of the interface to be reduced in area.

So these two profound effects which are esessitially required for the pigment disper sion in a system can be achieved through the use of wetting agent.

The simple dispersion of pigment particles in a vehicle or mediam is not generally stable because of the attraction which exists between individual particles due to London-Vander Waals' forces set up between the particles. This attraction is again due to electromagnetic forces set up between various atoms and molecules which form a solid body. So the interparticle attraction creates flocculation in the dispersed phase which settles down eventually although it can be redispersed by some mechanical means.

Solid-Solid Interaction :

The Vander Waals' forces, the cause of flocculation, which include Keesom force, Debye force, London dispersion force etc. all these forces fall off with the inverse sixth power of distance between the particles so that the attraction forces can be considered to be short range.

So some means of stabilization is invariably used in practice such as the provision of an energy barrier to hinder the close approach of the particles. By such means a dispersion may be rendered sufficiently stable for practical purposes.

Whether a dispersion will be stable or not can be determined by the consideration of a main factor, i.e., the change in potential energy between two approaching particles. The potential energy is considered to consist of terms which are due to attraction and to repulsion force It decreases with the increase in interparticle attraction and vice versa.

Difference between micro and macroscopic interparticle affinity :

In this context it should be borne in mind that the interparticle affinity must not be always dependent on the inverse sixth power of distance between the particles Actually it depends upon the particle size of pigments. The short range force of interaction occurs for very small and minute particles. But with the gradual increase of particle size the attraction is seen to be dependant on the inverse sccond power of distance of separation. Therefore, the attraction between macroscopic objects is long range. So due to the variation in particle size the interparticle attraction potential can be different. It is vividly expressed in the following diagram.



Attraction potential between particles of different size at varying distances of separation,

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Effect of particle size on flocculation :

The diagram shows clearly that as the distance between the particles decreases the interaction potential becomes considerably negative i.e., the attraction increases strongly. The larger the particles for a given distance of separation, the greater the attraction. The large negative potential of interaction denotes the greater interparticle attraction at large distances. So, the graph shows quite clearly why the particle should be of tiny size otherwise it would form stable flocculate very rapidly inspite of their distant separation. The gravitational pull is also another major reason for their rapid flocculation.

The pigment particle having range of size from .02-.1n would not show any strong attraction at an inter particle distance greater than 300A° and pigment having diameter above .1µ are very susceptible to flocculation because at an interparticle distance greater than 800A° also their attraction potential exists quite well. But to get a stable dispersion system the potential energy of most of the pigment particles should be at least +15KT and it has been experimentally verified that dispersed system consisting of most of the particles having potential energy less than 15KT would give rise to flocculation if the particles are allowed to approach without restraint.

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Amount of potential energy needed for stable suspension :

But the size of the pigment particles may not necessarily be always in the range $\cdot 02 - \cdot 05\mu$ because such a reduction of particle size in this range requires high cost and it may not be wanted for all purposes. So a compromise is necessary.

The above fact reveals that to make a dispersion stable the particles should have a repulsion potential of at least +15KT. But ordinary suspension do not contain a pigment particles having such a high repulsion potential.

Here lies the value of the electrical double layer which is formed due to preferential adsorp ion of polymeric materials by the pigment particles.

Electrical Double Layer :

The surface active agents used during grinding remains adsorbed preferentially on the pigment surface. Thus the ionic surfaciants import electrical charge to the pigment particles. The charge on the particles attracts ions of opposite sign from the surrounding medium. Therefore each charged particle is surrounded by a cloud of opposite or counter ions. The density of the counter ions falls off with increasing distance from the inner part of the double layer. Though the inner part of the double layer is formed due to adsorption by pigment particles it sticks to particle very fimly and cannot be separated easily, thus known as fixed layer. While the outer

part is more diffuse and extends into the medium because of thermal motion acting on these counter ions compensate to a certain extent the electrostatic attraction which leads to keep them in the neighbourhood of preferential y adsorbed surface. The potential of the charged particle determines the thickness of electrical double layer.

The electrical potential formed at the pigment surface due to adsorption of surfac ant producing fixed layer depends upon the amount of adsorbed ions and t eir individual strength, and this potential is known as Surface Potential.



The electrical double layer round a charged particle and the manner in which the surface potential falls off with distance from the inner layer of tightly-

adsorbed iors.]

Now if two such similar pigment particles approach each other the counter ions of each of the pigment surface begin to interact and give rise to a repulsive force. The force of repulsion increases with the decrease of distance between them.

Theoretically two extreme conditions of repulsion can be





achieved depending upon the particle size (a) and thickness of double layer, designated as 1/K.

When the particles are large and there is a thin double layer, i.e.,

a≫1/K. the net repulsion potential

$$V_R = \frac{\xi a \Psi o^2}{2} 1_n \left[1 + e^{-K(R-2a)} \right]$$

where the particles are small and double layer thickness is greater.

$$a \ll 1/K$$

 $V_R = \frac{\xi a^{\frac{1}{2}} q^{0} \sigma^2}{R} \left[e^{-K (R-2a)} \right]$

and as K-+o, i.e., the thickness is very high,

$$V_{R\rightarrow} \frac{\xi a^2 \Psi o^2}{R}$$

Here, ξ = Dielectric constant of the media

Po = Surface potential

R = Distance of separation

a = Particle size

The thickness of the double layer is given by-

$$1/K = \left(\frac{\xi KT}{8\pi ne^2 z^{\pm}}\right)^{\frac{1}{2}}$$

n = Concentration of ions at the surface

z-Valency of ions

In aqueous systems the double layer thickness 1/K is small but the concentration of ions is much high. But in non-aqueous systems where the number of ions n is small, thickness of double layer may be quite high having a thickness of up to 1µm.

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Therefore the pigment particles in a dispersion can be subjected to both attraction potential (V_A) due to interparticle affinity and the repulsion potential (V_R) due to the repulsive interaction of adsorbed double layer. So the net potential energy curves are obtained by summation of $V_A \And V_R$.

Energy barrier to prevent flocculation :

Factors of Vmax :



Net Interaction Potential between particles.

The curve passes through a maximum before falling steeply to -ve values as the particles approach closely. This maximum potential energy may create an energy barrier and as the particles approach one another there is a net force of repulsion which increases to a maximum af er which the particles are attracted strongly as the potential energy falls rapidly. Here lies a question whether the particles will be able to come across the energy barrier or not?

sufficient amount of particles having this Vmax energy the dispersion will flocculate because the particles can come across the barrier. It is generally considered that an energy barrier of 15KT is sufficient to produce a dispersion that is highly stable.

In the reverse case where the energy barrier is much less than 15 KT the particles may approach each other without restraint

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giving rise to flocculation because of their higher interaction potential.

Role of double layer as a steric hindrance :

So if any sort of hindrance is provided by which the particles, inspite of having higher interaction potential than Vmax, can not approach each other closely thereby flocculation is checked. In fact it is attained by the presence of adsorbed layers on the surface and these adsorbed layers may normally be made of polymeric surfactants, protective colloids like gum, gelatine etc. around the dispersed particles. By this means even when the max interaction potential is negative, the adsorbed layer can provide steric hindrance to prevent the particles coming close to each other, thereby reducing the change of flocculation.

Of course it is clearly expressed thatin the dispersion if energy of interaction is negative there is a sufficient number of particles in the dispersion with an energy of some positive value due to which if flocculates be formed they can be redispersed by simple mechanical stirring.

Here a table is given which helps to get an idea of thickness of adsorbed layer with the change of particle size needed to prevent flocculation.

TABLE

Particle Diameter (µ)	Thickness of adsorbed layer (Å) giving interaction POTENTIALS of—					
	-2KT	_5KT	-10KT	-15KT		
·02	1 18	10	1 5	3		
.05	43	25	12	10		
0.1	85	45	30	22		
0.2	150	90	57	43		
0.5	440	220	140	110		
1.0	880	440	285	215		

Thickness Of Adsorbed Layer Needed To Prevent Flocculation

The thickness of adsorbed layer increases with the increase of particle size because from the Graph showing the value of V/KT plotted against interparticle distance (Å) earlier, it is seen that the particles of larger diameter have a long distance attraction potential, as already discussed. So, the thickness of double layer is to be increased so that the higger particles cannot approach each other beyond their dis-

tance at which attraction potential starts.

Electrical Properties :

Pigment particles in a dispersion are electrically charged due to the preferential adsorption of ions from the continuous phase. These adsorbed ions are fixed on the surface of pigment particle and known as *fixed layer* which in turn have a tendency to attract oppositely charged ions towards it. These oppositely charged ions will be bound at some distance from the fixed layer by electrostatic attraction and it is known as diffuse layer or mobile layer which extends into the liquid phase. This layer may consist of ions of both the signs but its net charge is equal and opposite to that on the fixed layer. Such an arrangement is shown in the following figure—

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But inspite of such a double layer formation the characteristic charge of the pigment particles is held by the fixed layer.

Such an existence of charge of opposite signs on the fixed and diffuse layers leads to the appearance of a difference of potential between the two layers which is known as zeta potential or electro kinetic potential.

Electrophoresis and Endosmosis :

Since the pigment particles and its diffuse part which extends into solution carry opposite charges it is obvious that when an electric field is applied these charged particles move to the opposite polarity and the phenomenon is known as electrophoresis.

But if the case be reverse i.e., the size of the particles is of such nature that they cannot freely move when electric field is applied, but the vehicle moves in opposite direction to that of pigment particles it is termed as endosmosis.

Like the dispersed pigment system leather surface also acts as such a surface having a double layer around it for the surface of the leather is always charged, but the contact of such an oppositely charged double layer (due to the opposite charge of leather to the finishing season) creates disturbance in surroundings of both the system.

Applications :

An interesting phenomenon happens just like the application of electric field in a pigment dispersion system when the latters are brought in contact with the leather surface.

Depending on the potential gradient between the finishing season and leather surface the speed of migration of the finishing season, its penetration and bonding with the collagen fibre varies. So the potential gradient, ie., zeta potential between these two systems is to be carefully controlled for proper anchorage of the finished film with the leather.

The charge present on leather is again influenced by the various post tanning operations like neutralization, retanning, fatliquors etc.

So depending upon the zeta potential. i.e., potential gradient of the two systems, the hetter will be improvement in finishing process because two opposite systems break down or disturb the electrical Double Layer.

Pigment Dispersion :

Pigment particles are insoluble in water and their specific gravities are always higher than water and therefore pigment particles cannot be kept in suspension in water for a'long time by all means. On the other hand, the first requirement of leather season is that pigment particles should not settle at all. So we shall have to see for this settling phenomena much more analytically and should find out the reasons which are responsible.

Consider a discrete spherical particle (for easy calculation) in a medium surrounding it. It is found that the particle is acted on by two or three forces depending upon its particle size -(1) Gravitational pull which gives downward thrust, (2) Upward thrust due to buoyancy and (3) Brownian force of movement (if the particle size is in the colloidal range). For simplicity's sake, let the third force be removed,

So, the upward thrust or the buoyancy force which is defined by Stoke's law-

$F_{up} = 6\pi \eta r v$

- Where n-viscosity of the surrounding medium
 - r-radius of the spherical particle
 - v = velocity.

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Again due to gravitational pall, the particle will tend to settle down, and this downward force = $4/3\pi r^3$ ($\rho - \rho_1$) g, Where ρ = Density of the pig-

ment particle ρ₁ = Density of the medium g=acceleration due to gravity.

But for stability of the suspension, F upward = F downward. or $6\pi\eta rv = 4/3\pi r^2(\rho - \rho_1)g$

or
$$y = \frac{4}{3} \times \frac{1}{6} r^{\mu} (\rho - \rho_1) g \times \frac{1}{\eta}$$

= $\frac{2}{9} \times g r^{\mu} (\rho - \rho_1) \times \frac{1}{\eta}$
= $\frac{218 r^{\mu} (\rho - \rho_1)}{\eta}$

[as g=981cm/sec²]

So, the velocity of settling down of the particle is dependent on the diff. of density or sp. gr. of the pigment and medium. Therefore time required for settling down

 $t = \frac{\eta}{218 r^{9}(\rho - \rho_{1})}$ (because velocity = $\frac{\text{Distance}}{\text{time}}$).

Here t or v is also dependent on the radius of the particle with the decreasing trend of particle size and will increase, i.e., the time of settling will also increase providing the stability to the suspension. Again $(\rho - \rho_1)$ is another factor to be considered but this factor is to some extent rigid. As the selection of pigment is preferential, we cannot change its sp. gravity, Again the sp. gr. of the medium cannot be increased beyond 1.5 to keep the pigment in dispersed condition. Actually the sp. gr. and particle size of the pigment de-

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termines freedom from grittiness and instability. Again, according to the equation dispersionor rate of settling down is inversely related with viscosity. This is why the viscosity increase will enhance the stability of the system and that is done by the addition of ethylene—and propylene glycol and carboxy methyl cellulose which are added sometimes to increase its viscosity.

So, in case of ordinary particles of micro size the factors which are to be taken into consideration are—(1) The particle size of the pigment should be controlled and (2) $(\rho - \rho_1)$ may be decreased by increasing the sp. gr. of the medium which can be done upto 1.5 without affecting stabilization.

But when particle size of pigment falls below 1μ i.e., to the colloidal stage Brownian force of action occurs like the colloidal solution. In this case one more additive force also acts upon the pigment particles and the sum total of the force of liquid which is going to exert a movement on one side is quite different to that on the other giving rise to an inequilibrium condition. The Brownian force

$$B = 2.3 \log \frac{Co}{Ch} \times \frac{mgh}{R\Gamma/V}$$

where, V = Avogadro's no.

- m = effective mass of the particle
 - Co = Concentration of pigment at the level O
 - & Ch = Concentration of pigment at the levelh

R-Gas const.

T = Absolute temperature.

The equation shows that due to Brownian movement of particles, the concentration is different at different length of the axis of rotation.

Since Brownjan movement produces a spin in the dispersed particle, the radius of the particle is not fixed but varies depending on the axis of rotation. As long as this force acts on the particle to displace it from the equilibrium condition, the phenomenon is similar to the gravitational force, which tends to settle the particle. This settling down is related to the effective increase in diametre of the particle. The time of settling under the centrifugal force (w) generated is given by-

$$=\frac{18\eta l_n(R_2/R_1)\times 10^{-6}}{w^{9}d^{9}(\rho-\rho_1)}$$

Thus the higher the value of w, the lower will be the value of ts, i.e., time of settling will be less means settling will be much more rapid. However the most important aspect is the effective radius of the particle size and the differences in sp. gravity.

Stability of Pigment Dispersion :

To make a pigment effective for use in finishing purpose, its stability in dispersed condition is to be mainly taken into consideration. Several measures have been adopted to test the pigment stability. Earlier the dispersed system was kept for a few days to get its response to sedimentation and then the thickness of the deposit, its compactness etc. were taken to be the

Down Memory Lane



evaluation parameters. But it has no sharp scientific approach and moreover it is laborious for which now-a-days some rapid methods are in use for the same purpose.

Maseurement of Stability of Pigment Dispersion :

Firstly by the use of centrifuge the settling process and the size of the pigments can be measured in a reduced time but the main problem is that due to high centrifugal force all other forces are over weighed, as a result of which even short range particles also get sedimentated wherein lies its shortcomings.

Another is the testing of unstability by increasing the energy content of the system. Any system having higher energy will remain unstable and will not be in equilibrium. This principle is effectively adopted by raising the temperature of the dispersion system and simultaneously cooling it. This is recycled for several times as a result of which big particle size becomes more unstable than the smaller one and gets settled down.

Redispersion of Settled Mass :

The settled mass is also tested whether it can be easily redispersed or not because leather seasons sometimes on keeping for a long time forms sedimentation. If the sediment can be redispersed by stirring with a metal stirrer and the thickness of the sediment diminishes increasingly thereby with expenditure of minimum energy that dispersion may be used. But sometimes the cohesive forces between the pigment particles are so great that even stirring with the metal stirrer cannot reduce the thickness effectively when the total season needs to be thrown off. These two facts can be picturized with the following graph—

REDISPORSION THICKEMUS FEASIBLE. - REDISPERSING INFEASIBLE 个 + LOAD.

But in case the dispersed phase is sedimentated the stability can be increased by the increase of electrical double layer with the use of some polymeric materials as was seen previously, where the zeta potential also increases and electrical forces also increase which separate the pigment and this can be represented by the following equation—

$$V = \frac{Ee\gamma}{4\pi\eta} \times \frac{1}{299.8}$$

where V - velocity of pigment particle under an electric field

e = Djelectric constant

- E = Voltage (Volt/cm)
- n=Co-efficient of viscosity

y = Zeta potential.

Effect of PVC on the characteristics of the finished film :

Critical Pigment Volume Concentration :

When pigment is dispersed in a medium or vehicle, it was already stated that, depending upon the R. I. difference of pigment/vehicle interface, scattering and thereby the covering up property of the finished film is dependent. Again the number of interface also gives the number of sites for scattering. So with the increase of number of particles the covering up should be high. In this way in a given amount of vehicle if the amount of pigment particles are gradually increased a time will come when due to deficit of vehicle there will be no more solid/ liquid interface, i.e., the amount of vehicle is optimumly adsorbed by the each and individual pigment particle after which the addition of any more amount of pigment particle will bear solid/ air interface instead of solid/ liquid interface and that concentration of pigment which can be optimumly taken up by a given amount of vehicle is known as Critical Pigment Volume Concentration. Values higher than CPVC may increase the scattering and hiding power at the expense of tensile strength and other properties of the finished films.

Sometimes opacifiers are used to reduce the transparency of the finished film because these are highly porous materials reduced to fine particle size having air gaps within it which creates a site for scattering of light and thus make the film opaque or mat. These are silica, zinc stearate or zine oleate etc.

Critical pigment volume con-

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centration affects many of the important properties of the finished film which can be vividly pictured by the following graphs-





Film density is highest CPVC and therefore ideal.

Tensile Strength :



With the increase of the concentration of pigment in season the tensile strength of the finished film increases but when the concentration of pigment is optimum the tensile strength is maximum after which it tends to fall down and that optimum pigment concentration is CPVC.

Adhesion ;



Increase in pigment concentration increases the strength of adhesion which is maximum at the CPVC which is steeply reduced beyond that.

Light Scattering :



The increase in pigment volume concentration increases light scattering power of the finished film. Of course it increases steeply beyond CPVC when it makes the film porous, which should be avoided for leather finishing purpose.



Down Memory Lane —





Economic Corner

JEFFERIES SEES FISCAL PRESSURE BUILD-ING, WARNS OF CHOPPY MKTS



Fiscal pressure for the Indian economy is gradually rising, suggested analysts at Jefferies in a recent note, as oil prices (Brent) — which are close to the \$100 a barrel mark — continue to climb ahead of a busy election calendar. They added that the sharp rally in the equity markets during the last few months has made valuations costly.

As a result, Jefferies expects the Indian markets to remain choppy in the near term.

"Nifty above 20,000 with one-year forward price-earnings (PE) of 19.3x at +1 standard deviation and 12 per cent above 10-year average; our preferred yield-gap parameter (10-year bond yields less 1/Nifty PE), at 200 basis points (bps) is + 58 bps since March lows and +69 bps above average, pointing towards valuation discomfort," wrote Mahesh Nandurkar, managing director (MD) at Jefferies, in co-authored note with Abhinav Sinha and Nishant Poddar.

As a stock strategy, they have shifted consumer staples to underweight, and moved weight (bought into) to Bharti Airtel in their model portfolio. "We would buy the dips, as the medium term appears bright with the ongoing capital expenditure (capex) cycle recovery," Nandurkar said.

Surging oil prices

Rising oil prices, coupled with a busy election calendar in the months ahead, may exert pressure on the fiscal situation, said the Jefferies note. From around \$83 a barrel on August 21, oil prices have surged nearly 14.5 per cent as Russia and Saudi Arabia cut production. "With Brent crude oil price above \$90 a barrel, the headroom for a fuel price cut around Diwali (Q4 of CY23) is gone. "The reverse may happen, though with diesel prices, implying losses for public sector oil companies.

"Rising oil prices have adverse implications for the rupee as well, with every \$10 a barrel swing implying a 0.4 percentage point (ppt) change in the current account deficit (CAD)," Nandurkar wrote.

The political schedule will be a busy one during the next few months as five states — Madhya Pradesh (MP), Rajasthan, Chhattisgarh, Telangana and Manipur — go to polls.

These polls, experts suggest, will be an indicator of BJP's performance in the general elections, scheduled for 2024. In 2018, the BJP lost power in the three states of MP, Rajasthan and Chhattisgarh to the Congress. Jefferies said the busy election calendar is likely to exert pressure on the government for increasing social spending.

The spending may include schemes to boost annual transfers to farmers, expanding health insurance and interest subsidy on home loans. State freebies, they said, have already started in a big way. Nandurkar believes that a sharp rally in public sector undertaking (PSU) stocks may prompt the government to push for divestment in some companies.

"Senior ministers and bureaucrats suggest that the Bharatiya Janata Party (BJP) government is likely to build on the G20 momentum, with this week's new Parliament inauguration being a part of the mega projects completed under the Modi-2 government.

We also sense that up-fronting the national election to December 2023 (currently scheduled for April 2024) is unlikely, partly because of the weather (winter in hill states) and partly because of the Ram Temple opening on January 24," Nandurkar said.

A Jefferies note suggested in August that markets feel Prime Minister Narendra Modi has a 70 per cent chance of returning to power. From a long-term perspective, such a scenario bodes well for property and capex-related plays, including cement, infrastructure, capital goods, large banks, small and mid-caps, it said.

(Business Standard – 27/09/23)



Economic Corner

DEMAND FOR FRONTLINE JOBS DECREASED BY 17.5% IN FY'23



Having seen a rapid growth in demand for frontline workers in FY22 with the economy opening up, the growth seems to have muted in FY23 due to macroeconomic challenges.

According to BetterPlace's Frontline Index Report, total demand for frontline jobs decreased by 17.5 per cent. In FY23, 6.6 million frontline jobs were created in India as compared to 8 million in FY22. The drop can largely be attributed to global macroeconomic headwinds.

However, gig-work is seen to be on the rise as more and more enterprises are looking to variablise their workforce costs, said the report. E-commerce was the highest contributor to frontline worker employment in FY22 but has reduced significantly in FY23.

The dominance of the e-commerce sector has been replaced by the logistics & mobility and IFM & IT sector which together contribute to more than 61 per cent of the new jobs created.

However, e-commerce continues to be the highest employer of women frontline workers in FY23, contributing to 64 per cent of the total women workers employed.

Pravin Agarwala, Co-founder and Group CEO at BetterPlace, said: "The frontline workforce ecosystem seems to be one of the most dynamic cohorts in India. "They are the first ones to feel the impact of external economic environments.

"The macroeconomic headwinds have forced enterprises in India and Southeast Asia to rethink their hiring practices. "We are seeing rising gigification of the workforce, which has led to improvement in the women participation ratio. "This has created a need for tech solutions which can handle these fast-changing dynamics while at the same time improving productivity and retention."

While demand created by e-commerce has fallen by 52 per cent since last year, it is still the second-largest employer, contributing to 33 per cent of the total jobs.

Women participation ratio in the workforce doubled between FY22 and FY23.

Women participation ratio has increased from 3 per cent to 6 per cent between FY22 and FY23. This is largely due to the changing perception among families. According to the surveys, 88 per cent of women felt fully or somewhat supported by their families to join the workforce.

However, the average monthly salaries for women frontline workers in FY23 was 20.5 per cent lower than the industry average. The gap between youths and older cohorts is smaller for women frontline workers, with 44 per cent of them belonging to the 20-30 age category and 37 per cent belonging to the 30-40 age category.

Youth contributed the largest to frontline jobs at 66 per cent but their participation is slowly decreasing.

(Rediff.com - 25/09/23)

MSME LOAN: ELIGIBILITY, DOCUMENTS REQUIRED, LOAN AMOUNT, INTEREST RATE AND OTHER KEY DETAILS



An MSME loan can be beneficial for a business in case it's facing liquidity issues and needs funds for day-to-day operations or expansion plans.

Economic Corner



Entrepreneurs often avail loans for hassle free business operations or to meet fund crunch. Over time, various loans have been rolled out to by banks and NBFCs to support business owners in their entrepreneurial journey. One of the most popular types of entrepreneurial loans is Micro, Small, and Medium Enterprise Loans or MSME loans. These credit facilities financially help MSMEs to run their business and to expand operations.

What is an MSME loan ?

The MSME loan offers capital to businesses for their daily operations, such as purchase and maintenance of inventory. These loans can be availed via different banks in the country and the interest rates vary from bank to bank. The MSME loan interest rate starts from 8.75 per cent per annum and the actual applicable rate is decided by the lender.

There is no minimum limit for borrowing but the upper limit is set at Rs 2 crore. However, the upper limit can be revised as per business needs as per the lender's choice. Also, the loan may not require collateral if it's an unsecured business loan. The MSME loan tenure extends to up to 15 years. You might have to pay processing charges as specified by the lender.

What is the eligibility criteria for MSME loan ?

- An excellent credit score of the business owner and a healthy credit history.
- The business should have a minimum income of Rs 2 lakhs per financial year.

- The minimum yearly turnover of the business should be at least Rs 10 lakh.
- The enterprise should be financially stable.
- The authorised signatory should be aged between 21 and 65 years.
- The authorised signatory should have worked for a minimum of one year in the organisation.
- Public limited companies, Private limited companies, Sole proprietorships, Partnership firms, and Limited Liability Partnerships (LLPs) are eligible to avail MSME loans.

Documents required for MSME loan

- KYC documents of the authorised signatory, such as the PAN card, Aadhaar card, driving licence, voter ID, passport, and utility bills.
- The enterprise's address proof, including rental agreement, lease agreement, sale deed or utility bills.
- Business' bank statements of the last six months.
- Business incorporation certificate or establishment certificate.
- Previous two years' profit and loss account and balance sheet statement.
- Enterprise's PAN card and income tax return records.
- Any additional document as requested by the concerned bank or NBFC.

(https://www.zeebiz.com/ - 16/09/2023)

-: <u>JILTA</u>:-

Owner: Indian Leather Technologists' Association, **Publisher & Printer**: Mr. S. D. Set, **Published From**: 'Sanjoy Bhavan', (3rd floor), 44, Shanti Pally, Kasba, Kolkata - 700107, West Bengal, INDIA and **Printed From**: M/s TAS Associate, 11, Priya Nath Dey Lane, Kolkata- 700036, West Bengal, INDIA

ILTA PUBLICATION

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Indian Leather Technologists' Association

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

'Sanjoy Bhavan', 3rdFloor, 44, Shanti Pally, Kolkata- 700 107, WB, India Phone : 91-33-2441-3429 / 3459 WhatsApp +91 94325 53949 E-mail : admin@iltaonleather.org; mailtoilta@rediffmail.com Website : www.iltaonleather.org





History and Activities of Registration No. KOL RMS/074/2022-24 Indian Leather Technologists' Association

The Indian Leather Technologists' Association (ILTA) was founded by Late Prof. B. M. Das, the originator of Das-Stiasnay theory and father of Indian Leather Science on 14 th August' 1950. The primary objectives of the oldest Leather Technologists' Association which celebrated its Diamond Jubilee year in the 2010, are:

- To bring all concerned with the broad spectrum of the leather industry under one umbrella.
- To organize seminar, symposium, workshop in order to create information, knowledge and latest 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 prospects.
- To publish monthly journal as a supplement to those above objectives. The monthly journal of ILTA is known as journal of Indian Leather Technologists' Association and is the most widely circulated technical journal concerning leather technology.
- To publish text books for the benefit of students at various levels of study, for the researchers and industry.
- To have interface between urban and rural sector.
- To assist Planning Commission, various Government Institutions, Ministry and autonomous bodies to formulate appropriate policies acceptable and adoptable to the industry.
- To organize practical training and to provide skilled manpower and to motivate good students for study.

• To conduct activities related to the growth of the export of leather and leather goods from India. ILTA also organizes Prof. B. M. Das Memorial Lecture every year during the Foundation Day Celebrations on 14 th August and Sanjoy Sen Memorial Lecture on 14 th January, the birthday of our late President for several decades. Many reputed scientists, industrialists and educationists have delivered these prestigious lectures. Foreign dignitaries during their visits to India have addressed the members of ILTA at various times.

ILTA have published the following books:

- 1. An Introduction to the Principles of Physical Testing of Leather by Prof. S.S. Dutta
- 2. Practical Aspects of Manufacture of Upper Leathers by J. M. Dey
- 3. An Introduction to the Principles of Leather Manufacture by Prof. S. S. Dutta
- 4. Analytical Chemistry of Leather Manufacture by P.K. Sarkar
- 5. Comprehensive Footwear Technology by Mr. Somnath Ganguly
- 6. Treatise on Fatliquors and Fatliquoring of Leather by Dr. Samir Dasgupta
- 7. Synthetic Tanning Agents by Dr. Samir Dasgupta
- 8. Hand Book of Tanning by Prof. B. M. Das



ILTA presents awards in the name of Prof. B. M. Das Memorial, Sanjoy Sen Memorial and J. M. Dey Memorial Medals to the top rankers at the University graduate and post graduate levels. J. Sinha Roy Memorial Award for the anthor of the best contribution for the entire year published in the monthly journal of the Indian Leather Technologists' Association (JILTA). From the year 2023 ILTA has started to present a Scholarship namely Prof. Moni Banerjee Memorial Scholarship to a Student of B. Tech / M. Tech Leather Technology who is meritorious but financially crippled.

ILTA is the Member Society of IULTCS (International Union of Leather Technologists' and Chemists Societies) which is a 125 years old organization. The International Congress of this union is held in different locations of the world once in two years. In its 125 years history, for the first time the Congress was held in January 1999 outside the developed countries and that too in India at CLRI, Chemai. Indian Leather Technologists Association organized the Congress under the able leadership and guidance of Late Sanjoy Sen, the then President of ILTA and IULTCS and Dr. T. Ramasami, the then Vice-President of ILTA and Director, CLRI, Chemai. In 2017 IULTCS Congress was successfully held again at Chemai, India for the second time. In order to promote and provide marketing facilities, to keep pace with the latest design and technology, to have better interaction with the domestic buyers, ILTA has been organizing LEXPO fairs at Kolkata from 1977, Siliguri from 1992 and Durgapur from 2010. To help the tiny, cottage and small-scale sectors industries in marketing, LEXPO fairs give the exposure for their products. Apart from Kolkata & amp; Siliguri and Durgapur, ILTA have held LEXPO at Bhubaneswar, Gangtok, Guwahati, Jamshedpur and Ranchi. In commensurate with the time, demand and new perspective of the modern leather users, ILTA has started to organize LEXPO at Kolkata from 2022 in a new shape with the Manufacturers and Exporters of Leather Goods from all over India.

ILTA has celebrated its Golden Jubilee with a year-long programme from 14 th August' 2000 to 13 th August' 2011 along with the first conference of South East Asian Countries at Netaji Indoor Stadium, Kolkata.

ILTA has also celebrated its Diamond Jubilee with a year long programme from 14 th August' 2010 to 13 th August' 2011 which included National Seminars, B. M. Das Memorial Lecture, Sanjoy Sen Memorial Lecture, Moni Banerjee Memorial Lecture, Y. Nayudamma Memorial Lecture and 3 day's AICLST (Asia International Conference on Leather Science and Technology) at Hotel 'The Stadle' at Salt Lake City, Kolkata.

The Association's present (as on 31.03.2023) strength of members is around 550 from all over India and abroad. Primarily the members are leather technologists passed out from Govt. College of Engineering and Leather Technology – Kolkata, Anna University – Chemnai, Harcourt Butler Technological Institute – Kanpur, B. R. Ambedkar National Institute of Technology – Jalandhar and Scientists and Research Scholars from Central Leather Research Institute (CLRI).

In order to strengthen its activities, ILTA have constructed its own six storied building at 44, Shanti Pally, Kasba, Kolkata – 700107, West Bengal, India and have named it as "Sanjoy Bhavan".

This Association is managed by an Executive Committee duly elected by the members of the Association. It is absolutely a non-profit making voluntary organization working for the betterment of the Leather Industry. None of the Executive Committee members draws any remuneration for their services rendered but they get the satisfaction of being a part of this esteemed organization.



Indian Leather Technologists' Association

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