

**ENVIRONMENTAL CHALLENGES AND RECENT  
TECHNOLOGICAL DEVELOPMENTS IN WORLD  
LEATHER SECTOR**

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**Planning to include Ethiopia, East African Countries,  
Vietnam etc.**

## ANNUAL IUE COMMISSION MEETING IN ONE OF THE HOST COUNTRIES

Kolkata, India – November 2010



Valencia, Spain – September 2011

## **IUE COMMISSION ACTIVITIES**

- Development of IUE documents 1 to 11 & 12.
- Data collection and preparation of documents on Environmental update in leather producing countries – China, Brazil, Argentina, India, Spain, Taiwan, Turkey etc.
- Translated in regional languages (Chinese, Spanish, Turkish etc.)
- Dissemination through IULTCS website, UNIDO, UNDP, European Union etc.
- Presentation in IULTCS Congresses and Regional Conferences
- Technical guidance/advice to Member associations / Countries

## **IUE COMMISSION DOCUMENTS**

- IUE 1 - Viable Cleaner Technologies for Leather Production**
- IUE 2 - Tannery Solid By-Product Management**
- IUE 3 - Total Dissolved Solids and Salinity aspects (New draft under preparation)**
- IUE 4 - Assessment for Chromium containing Waste from the Leather Industry**
- IUE 5 - Typical Performance of Tannery Waste Water Treatment Systems (under revision)**
- IUE 6 - Pollution Discharge Values from Tannery processes Under Conditions of Good Practice (Under revision)**
- IUE 7 - Chargeable Effluent Parameters From 25 Countries**
- IUE 8 - Odour Control in Tannery / Treatment Plant**
- IUE 9 - Special requirements for Sewers Adapted for Tannery Effluents**
- IUE10 - Document for Restricted Products in Leather (Under revision)**
- IUE 11- Recommendations for Occupational Safety and Health in the use of Chemicals in Tannery, Process and Treatment Plants**
- IUE 12- Concept and guidelines for Carbon footprint for Leather Sector (in co-operation with UNIDO) - New**

## **WORLD LEATHER PRODUCTION & WASTE GENERATION**

### **Total World Leather Process and Waste Generation**

- **Leather process – 15 million tons/ year**  
China : 23% – Italy : 16% – Brazil : 13% – India –Turkey – Argentina – Spain – Vietnam – East African Countries etc.,
- **Wastewater discharge – 1,500 MLD**
- **Tannery Solid waste – 6 million tons / year**
- **Sludge generation – 4.5 million tons/year**

## **GLOBAL ENVIRONMENTAL REGULATIONS**

- ❖ All leather producing countries have introduced specific pollution control regulations including leather sector.
- ❖ Most of the standards are based on European/ American standards – Enforcement level varies from country to country and region to region.
- ❖ In India, China and other countries, new tanneries can be established only in approved industrial estates with Common Effluent Treatment Plants (CETPs).
- ❖ Resettlement of tanneries to industrial complex – Izmir, Istanbul, Kolkata (India), Cairo (Egypt), Bangladesh etc.
- ❖ R & D and investment on Common Effluent Treatment plants (CETPs) are taking place in leather producing countries – China, Italy, India, Spain, Latin American Countries, Brazil, etc.,

## NEW REGULATIONS AND TARGETS BY NGO'S

- In addition to Govt. regulations, NGO's such as Green Peace started fixing targets on the entire supply chain
- Total control / elimination of chromium
- Zero liquid discharge is insisted by NGOs
- Development of guidelines for Life cycle analysis and carbon footprint - started in European Union

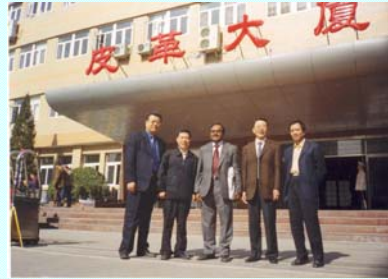


## ASIA - MAJOR LEATHER PRODUCING COUNTRIES CHINA, INDIA, TAIWAN, BANGLADESH, VIETNAM, PAKISTAN, INDONESIA



## ASIAN COUNTRIES - CHINA

- China is the World Leader in Leather Production (about 23 to 25%)
- There are about 700 tanneries
- **Process of raw to semi-finish is reduced to control pollution.**
- Small scale tanneries (about 400) with lesser capacities have been closed as per new regulations.



China Leather Research Industry Association, Beijing, China



A special self cleaning screen and Biological treatment

## ASIAN COUNTRIES - CHINA

- About 13 CETPs has been built in China leather industry
- **Increase in production permitted without increase in water usage.**
- **Water recovery and reuse is adopted to increase the production capacity**



Submerged Membrane Bioreactor plant in Simona Tanning for water recovery

R & D activities on cleaner leather production and environment are being carried out by many universities



## ASIAN COUNTRIES - INDIA

(50 Individual Units and 15 CETPs) – Mainly in Tamilnadu State



MEMBRANE SYSTEM FOR RECOVERY OF WATER FROM TANNERY EFFLUENT UNDER ZERO DISCHARGE CONCEPT – RESIDUALS SALINE STREAM DISPOSAL IS YET TO BE ADDRESSED

## ASIAN COUNTRIES - INDIA



- Planned to upgrade and implement a biggest CETP (32- 48) MLD of its kind in the world - Benefit to 450 tanneries
- Estimated cost - 50 million USD
- Zero Liquid Discharge (ZLD) is mandatory in some states of Tamilnadu
- Tanning operations and waste discharges increased in UP and other Northern states – Reduction in Tamilnadu
- Preparation of guidelines for life cycle analysis and Clean Development Mechanism (CDM)



## **ASIAN COUNTRIES - TAIWAN**



**TANNERIES ARE LOCATED IN MIXED INDUSTRIAL AREAS**



**TANNERY EFFLUENT TREATMENT PLANT IN MULTI STORY LEVEL –**

**TAIWAN LEATHER INDUSTRY HAS MAJOR LINKAGE WITH CHINA**

**9<sup>TH</sup> AICLST 2012 was organized in TAIPEI, TAIWAN**

## **ASIAN COUNTRIES – BANGLADESH , VIETNAM, PAKISTAN Etc.**

- **China outsources Vietnam and Bangladesh for raw to semi finish operations**
- **Nearly 50% process starts only from semi finished leather in China due to environmental protection measures.**
- **Relocation of tanneries in an industrial complex with CETP is under progress in Bangladesh**

## EUROPE - MAJOR LEATHER PRODUCING COUNTRIES - ITALY, TURKEY, SPAIN, FRANCE & EAST EUROPEAN COUNTRIES



### EUROPEAN COUNTRIES - ITALY Second major leather producer in the world (16%)



- About 10 CETPs are under operation
- Total biological treatment system without chemical use in the biggest CETP (30mld) – Discharge in to backwaters
- Thermal treatment of sludge, energy generation and reduction in volume



Central chrome recovery and reuse system for cluster of tanneries

Pilot studies on membrane system for TDS management

## EUROPEAN COUNTRIES - SPAIN



**NEW CETP IN IUGALADA**



**Reverse Osmosis system with membrane bioreactor for**



**Recovery of Water for Reuse in a CETP, LURCA, SPAIN - Sustainability is a problem –Small scale tanneries will be shifted to industrial complex – ★CETP will serve for industrial effluent plus domestic sewage**

## TURKEY

- **Istanbul (Tuzla) and Izmir have centralized effluent treatment plants with sea discharge**
- **Leather research activities are carried out in the institutions located in Izmir and other places**



**Document on Environmental challenges in Leather sector - Turkey (Dr.Volkan Candar & Dr.S.Rajamani)**

- **Schedule to organize IUE Commission meeting and IULTCS Congress in Istanbul – 28<sup>th</sup> to 31<sup>st</sup> May 2013**

## **FRANCE**

- **Tallow extracted from fleshing converted into alternative energy source.**
- **Treatment of tannery effluent adopting reed bed system**
- **Active R & D in CTC, Lyon, France**
- **Development of system for life cycle analysis and carbon footprint etc.**

## **UNITED KINGDOM**

- **Down flow gasification system**
- **Short-term preservation of raw hides**
- **Development of life cycle analysis, clean development mechanism, carbon footprint etc.**
- **Active HRD in leather education and training**

## LATIN AMERICA



## ENVIRONMENTAL ASPECTS IN LATIN AMERICAN LEATHER INDUSTRY

### Latin American countries

Brazil – Argentina – Colombia - Uruguay etc.,

- **Leather process** – 3 million tons/ year
- **Wastewater discharge** – 400 mld
- **Tannery Solid waste** – 1.2 million tons / year
- **Sludge generation** – 1.5 million tons/year

## ARGENTINA

- Meat consumption reduced from 80 to 53 kg/inhabitant as per 2011 data. Reduction in raw hide generation
- **8 big tanneries**
- 40-50 medium & small tanneries
- **70 Associated units - mostly located near Buenos Aires**
- Waste water discharge : 10 Million m<sup>3</sup>
- **Environmental regulations are similar to United States & European Union**

## New Developments - ARGENTINA



- ACUMAR a Government agency decided to develop an industrial park for tanneries in Lanus, Buenos Aires.
- A common Effluent Treatment Plant (CETP) is under construction in the industrial park.
- Sludge disposal is a major issue

EFFLUENT TREATMENT PLANT IN ARGENTINA

## BRAZIL

Statue for a Tannery worker in an industrial estate - Brazil



- Brazil is the third largest leather producer with share of about 13%
- **750 tanneries** - mainly located in Rio Grande do Sul and Sao Paulo States.
- Environmental Standards based on CONSEMA N° 128/ 2006 – Environmental regulations for disposal of waste leather

## LATIN AMERICA - BRAZIL



- Process of unsalted fresh hides - Insisted by Environmental Authorities
- The removal of Nitrogen, toxicity etc are problems in the treated effluent
- Tanning operations shifted from South Brazil to North

## LATIN AMERICA - COLOMBIA

- Due to new stringent standards proposed during 2011/2012.
- Volume of effluent discharged is limited to 470 – 520 litres per hide of 28 kg weight
- New law based on overall load and not on concentration
- Many tanneries are closed and some tanners face legal actions
- Tanneries have to follow best available techniques (BAT) to reduce flow and treatment system



## LATIN AMERICA - URUGUAY

- Average meat consumption per inhabitant is 60.6 kg per year – maximum per capita in the world – One of the low tax countries in Latin America
- Large and medium scale units have effluent treatment plants and specific secure landfill
- XVIII Latin American Congress (FLAQ TIC 2012) was organized in Uruguay during 9<sup>th</sup> to 11<sup>th</sup> October 2012.
- A joint report on Environmental Challenges in Latin American Countries was prepared and published in English and Spanish.



## NORTH AMERICA - USA

- Export of salted hides, reduction in no. of tanneries
- Climate Change issues raised with cattle population in India, China etc.

EWCA, HAWAII –  
CLIMATE CHANGE  
PANEL MEMBERS



**Clean Development Mechanism - Disposal of unsalted hides as garbage Vs Leather production - Carbon Footprint insisted on products from other countries**

## DEVELOPMENT OF DOCUMENT FOR CARBON FOOTPRINT FOR LEATHER PRODUCTS – BY IUE COMMISSION OF IULTCS



Montevideo, Uruguay – October 2012 – Latin American Congress

Taipei, Taiwan - November 2012 - 9<sup>th</sup> Asian Congress

Welcome to IULTCS Congress - Istanbul, Turkey – 28<sup>th</sup> to 31<sup>st</sup> May 2013

## SUSTAINABILITY OF TANNING INDUSTRY

- ❖ Due to enforcement of environmental regulations- the import and process of raw to semi-finished leather is reduced in China
- ❖ Countries like United States export more raw hides – reduction in tanning process
- ❖ Threat to natural leather process from synthetic footwear and other industries referring pollution and carbon footprint aspects
- ❖ Sustainability of SMEs is a major problem due to enforcement of environmental regulations
- ❖ Continued R & D on reduction of salt in all levels, cleaner production, minimization / utilization of solid waste / sludge etc. to reach sustainable carbon footprint.



*Dr. S. Rajamani*

**THANK YOU**