



**KENYA INDUSTRIAL RESEARCH AND DEVELOPMENT INSTITUTE**

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# **INTEGRATION OF ECO-FRIENDLY TANNING AND CIRCULAR ECONOMY FOR SUSTAINABLE LEATHER SECTOR IN KENYA: CHALLENGES AND ADOPTION**

**BY**

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# The Concept of Circular Economy

- Circular Economy: products and materials are designed for durability and to be;
  - Reused
  - Recycled, Recovered
  - Remanufactured
  - Avoid or zero-emissions
- An industrial system that is restorative or regenerative.



# Leather Industry and Circular Economy

- ❖ Leather is a byproduct of the meat industry.
- ❖ The sector plays a significant role in the recovery and recycling of hides/skins.
- ❖ Contributes to circularity by recovery of the discarded products.
- ❖ Value added products.



# Leather Manufacturing Challenges

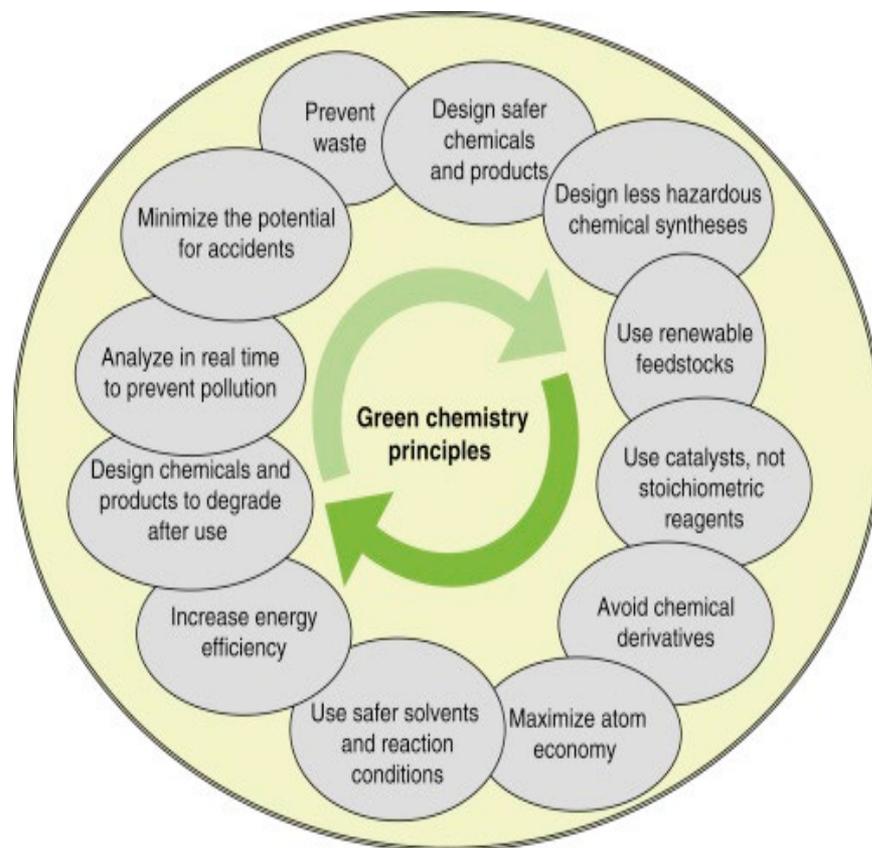
- ❖ Environmental impact
  - Chemicals and pollutants
  - wastewater and effluent
  - Solid waste
- ❖ Risk to human health
- ❖ High cost of effluent treatment.
- ❖ Regulatory compliance.
- ❖ Consumer demands.



# Eco-tanning for sustainability

❖ **Eco-tanning**: environmental friendly processes that are designed to cause no harm to human and environment, i.e. provisions of;

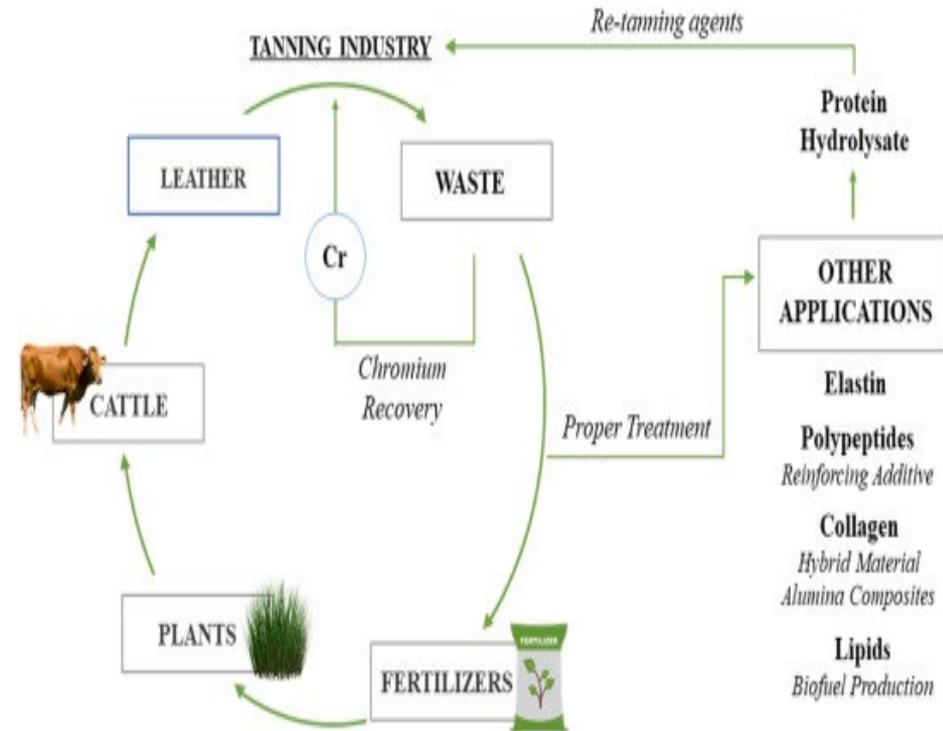
- Waste minimization and management.
- Pollution control: air, water, soil
- Correct use of chemicals
- Occupational safety & health



# Eco-tanning and circular economy model

## ❖ Sustainable Technologies

- Phyto-based preservation, chilling or process fresh hides/skins.
- Hair-recovery e.g. enzymatic, oxidative processes.
- Recycle spent liquors.
- Partial substitution of ammonium salts with CO<sub>2</sub> and/or weak organic acids.
- High exhaust tanning & post-tanning systems.
- Alternative green tannages.
- Chrome recovery and reuse system.
- Enhanced dye exhaustion
- Eco-benign finishing systems
- Bio-based odour abatement & waste management



- Value added products from waste

# Challenges in implementing Circular Economy

- ❖ High investment costs in new infrastructure.
- ❖ Lack of understanding of the emerging circular economy business model and clear strategy.
- ❖ Non existing or lack of efficient recovery and/or recycling technologies.

# Challenges in implementing Circular Economy

- ❖ Lack of creativity and innovation in the industry.
- ❖ Lack of markets for recycled products.
- ❖ Inadequate skilled labour in cleaner technology.
- ❖ Fear of losing recurrent customers.

# Strategies to implement Eco-tanning and Circular Economy

- Modernization and investment in infrastructure
- Skills development and adoption of cleaner technologies.
- Designing processes and products that are efficient and sustainable.
- Collaboration between institutions and industry stakeholders; knowledge/experience sharing.
- Promote creativity, innovation and standards across all industries.

# Conclusion

- Adoption eco-friendly tanning technologies paves the way towards sustainable performance of the leather sector and a more circular economy in pursuit of economic, social, health, safety and environmental benefits.



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# THANK YOU

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