switchasia

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IMPACT SHEET: Effective waste management & sustainable development of the MSME tanning companies in Kolkata leather cluster (Bantala)

169 MSMEs adopt sustainable leather tanning business practices

Improved resource efficency and cost savings through water, energy and waste conservation

6 CLEAN WATER AND SANITATION

8 DECENT WORK AND ECONOMIC GROWTH

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

17 PARTNERSHIPS FOR THE GOALS

PROJECT BACKGROUND

The SME tanning industry at the Bantala Leather Cluster near Kolkata in West Bengal, India, is organized under the Calcutta Leather Complex Tanners Association (CLCTA). Effluent water from the SME tanneries is treated at a Central Effluent Treatment Plant (CETP), ensuring that the high levels of salts, lime, and chemicals (including chromium) are managed before the water is discharged into the sea. The CETP is currently operating at full capacity.

In addition to wastewater, the tanning industry generates significant amounts of high-polluting solid waste, such as fleshings, off-cuts, and sludge. The West Bengal government has announced plans to expand the Bantala Leather Complex to support SME growth in the tanning and leather manufacturing industry. However, without adequate waste management solutions, this expansion will not be sustainable.

Despite the sector's strong growth potential, it faces severe pollution challenges due to the lack of clean and green technologies. To support further economic growth in line with national and global market demand, it is essential to address environmental issues, improve waste management, and enhance the efficiency and quality of tanning processes. The adoption of advanced, clean technologies that comply with pollution norms has become a critical pathway for the sector's sustainability.

CHALLENGE

The major challenges facing the cluster include the predominant use of water-intensive tanning processes, unorganized raw material handling and sourcing, and limited awareness of modern equipment to strengthen the supply chain. Many medium- and small-scale tanneries do not invest in eco-friendly technologies due to insufficient information, technical know-how, and funding. In addition, a largely unskilled workforce and poor knowledge of chemical management contribute to unhealthy and inefficient working conditions.

PROJECT OBJECTIVES

The objective of this EU funded SWITCH-Asia project is to build capacities and create enabling conditions among tanneries and their public–private support organizations for the large-scale adoption of improved waste reduction and solid waste management practices and technologies, in order to meet the increasingly high international quality and environmental standards in the leather market.

The specific objectives include:

- Making production processes more transparent and sustainable by adopting cleaner and greener technologies.
- Promoting responsible and sustainable practices in solid waste recycling and pollution reduction.
- Organizing training and capacity-building for workers to support green job creation.
- Enhancing workers' well-being through Occupational Health & Safety workshops.
- Raising awareness on gender equality among workers.

TARGET GROUPS

- 350 Micro, small and medium scale tanning companies in the Bantala leather cluster
- 8,500 workers in the tannery sector
- 4,000 MSME leather product manufacturers and their 52,000 employees
- People living and working near the Kolkata leather complex, Bantala

PROJECT ACTIVITIES

Demonstration of Eco-Friendly, Commercially Viable Sustainable Practices

Solidaridad has worked together with PISIE, Dugros, Stahl, and Indian subcontracted technical experts to plan and implement a series of green tanning and waste reduction technologies at the company level. These demonstrations are based on proven technologies that were previously unfamiliar to the MSME tanneries in Bantala.

The green tanning and waste management technologies are introduced under local management conditions to show their impact on (a) waste reduction and (b) the business case for tanneries. The commercial benefits may take the form of cost reductions or new income opportunities.

Each demonstration is followed by a group of managers and supervisors from other tanning companies through a series of Training of Trainers (ToT) programmes.

Capacity Building within the Calcutta Leather Complex Tanners Association (CLCTA)

Several important interventions cannot be introduced at the individual company level but require collective action across the Bantala Leather Cluster. The Calcutta Leather Complex Tanners Association (CLCTA) will serve as the institutional partner for Solidaridad, PISIE, and other technical experts involved in this initiative.

Facilitating Cooperation between Tanners, Services, and Experts

Solidaridad has convened a stakeholder platform that brings together CLCTA board members, financial institutions, technical experts, local government representatives, and representatives from the tanning and leather supply industries. A Memorandum of Understanding (MoU) between the stakeholders outlines the platform's purpose, responsibilities, and operational procedures.

Effective Project Coordination, Monitoring, and Communication

As the main applicant and overall coordinator, Solidaridad is responsible for project planning and coordination, as well as for monitoring and evaluating the project's progress and results.

LESSONS LEARNED

The project faced significant disruption due to the COVID-19 pandemic, which struck soon after the inception phase. Between mid-2020 and late 2021, nationwide lockdowns in India and regional containment measures in West Bengal led to the suspension of key ground-level activities, including surveys, demonstrations, training, and stakeholder consultations. Travel restrictions and safety mandates further delayed technical diagnostics, feasibility assessments, and the deployment of specialized equipment. Training programmes and public-private events were either postponed or shifted online, limiting participation and knowledge transfer, especially for low-literacy tannery workers and plant operators.

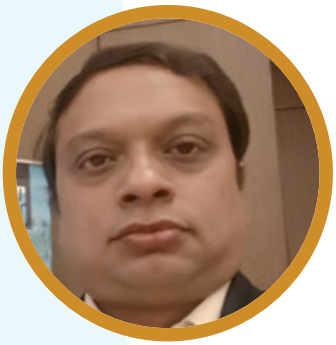
In response, Solidaridad adopted an adaptive management approach, pivoting to digital outreach through webinars, online modules, and virtual stakeholder engagement. Custom video tutorials on cleaner tanning technologies and occupational health and safety (OHS) were developed and disseminated via online platforms and email circulars. These measures ensured continuity of capacity building, technical exposure, and awareness generation despite the pandemic's constraints.

During project implementation, several insights emerged that informed decision-making and mid-course corrections while also laying the foundation for replication, upscaling, and advocacy across other industrial ecosystems. Key lessons include: behavioral transformation takes time but is achievable; technology adoption requires regulatory support and cost justification; digitally enabled capacity building enhances reach and impact; circular economy models are viable at the MSME scale; and infrastructure must be matched with skills and institutional anchoring.

PROJECT ACHIEVEMENT

Key achievements during the project period include:

- 126 MSME tanneries adopted at least one sustainable tanning practice, with over 348 demonstration sites established for green technologies.
- Installation of desalting machines reduced water consumption by 783 million litres and carbon emissions by 941.8 tCO_2eq annually.
- Water usage reduced by 28% through water-optimizing technologies.
- Carbon footprint reduced by 18.33%.
- 1,220,000 kilograms of solid waste were recycled into paver blocks, bonded leather, tallow, and recovered cured salt.
- Capacity building provided to 262 managers and 788 workers on sustainable practices.
- OHS workshops trained 5,625 workers on well-being and safety protocols.
- A multi-stakeholder PPP was launched with CLE, CLCTA, knowledge partners, project stakeholders, and industry owners.
- Gender sensitization workshops engaged 737 participants (99 women and 638 men).
- Establishment of a Centre of Sustainability, a medical centre, and an SLF site as part of the roadmap for the future.



Pradipta Konar
Solidaridad Regional Expertise Centre

> “This project is an important initiative to foster sustainability in the largely unorganized leather sector. The sector provides livelihoods to many people from marginalized communities and contributes significantly to the country’s revenue. I extend my heartfelt gratitude to the EU for giving me the opportunity to lead such an impactful and meaningful project.”

Long-term project sustainability

The project has been strategically designed to ensure continuity and self-sustainability beyond the funding period. Key achievements include the integration of desalting machines into regulatory requirements by the Government of West Bengal, guaranteeing cluster-wide adoption, and sustained dialogue with regulatory bodies to shape future compliance frameworks. Local industry associations such as CLCTA, ILPA, and ILTA have assumed ownership of demonstration units and training resources, positioning themselves as long-term custodians of knowledge and practices. Infrastructure such as the Centre of Sustainability, the Solid Waste Training Centre, and the Medical Centre at Bantala further consolidate these interventions, serving as hubs for innovation, training, and stakeholder engagement.

Building on this foundation, follow-up activities are focused on scaling circular economy solutions, strengthening capacity-building, and introducing monitoring and certification systems aligned with international sustainability standards, particularly EU market requirements. With institutional anchoring, regulatory endorsement, economic viability, and physical infrastructure in place, the Action has transitioned from a donor-supported initiative into a catalytic platform for the systemic transformation of the leather sector. The Bantala model is now set for replication in other major leather clusters across India, ensuring that the benefits of resource efficiency, waste valorization, and sustainable practices continue to grow and generate long-term impact.

Project contributions to Climate Change Mitigation and SDGs

The project directly contributes to SDG 12 by advancing resource efficiency, circular economy practices, and sustainable production processes. Through the mainstreaming of technologies such as desalting, enzyme-based dehairing, and water-optimizing systems, it significantly reduces chemical and water use, thereby lowering the environmental footprint of MSME tanneries. Waste utilization initiatives, such as converting sludge into paver blocks, extracting tallow from fleshings, and repurposing leather trimmings and cuttings, further reinforce circular economy models by ensuring resources are reused rather than discarded.

SDG 1 – No Poverty: Improves livelihoods of MSME workers by reducing costs, enhancing productivity, and creating opportunities in green tanning technologies. SDG 2 – Zero Hunger: Contributes indirectly by promoting healthier working conditions and income security, enabling better household nutrition. SDG 3 – Good Health and Well-being: Establishment of a Medical Centre and reduction in harmful chemical exposure improve occupational health and community well-being. SDG 4 – Quality Education: Capacity-building, training-of-trainers (ToTs), and technical training provide continuous skill development for tannery workers and technicians. SDG 5 – Gender Equality: Inclusion of women in training and cluster-level initiatives fosters participation in an otherwise male-dominated sector. The establishment of an All-Women Working Unit marks a significant step toward gender equality. SDG 6 – Clean Water and Sanitation: Effluent load reduction, desalting machines, and water-efficient technologies ensure cleaner water discharge and improved sanitation in the cluster. SDG 7 – Affordable and Clean Energy: Adoption of resource-efficient technologies, such as the use of biogas, reduces energy intensity in tanning processes. SDG 8 – Decent Work and Economic Growth: Promotes safe working conditions, skill enhancement, and MSME competitiveness, thereby safeguarding jobs and supporting income growth. SDG 9 – Industry, Innovation and Infrastructure: Establishment of the Centre of Sustainability and the Solid Waste Training Centre (SLF site) anchors innovation and sustainable industrial infrastructure. SDG 10 – Reduced Inequalities: Capacity-building for small-scale tanners, often marginalized in the global value chain, helps reduce disparities with larger players. SDG 11 – Sustainable Cities and Communities: Cleaner production practices reduce cluster-level pollution, contributing to Bantala’s transformation into a sustainable industrial hub. SDG 13 – Climate Action: Carbon footprint reduction, improved resource efficiency, and lower emissions contribute to climate change mitigation. SDG 14 – Life Below Water: Reduction of saline and chemical effluents lowers risks of water pollution, protecting aquatic ecosystems downstream. SDG 15 – Life on Land: Solid waste management and eco-friendly processes minimize land contamination and help safeguard biodiversity. SDG 16 – Peace, Justice and Strong Institutions: Strengthened collaboration with WBPCB, the MSME Directorate, and industry associations builds transparent, accountable, and resilient institutions for environmental governance.

Impacts at a Glance

Economic Impact	• 8 million EUR saved annually by implementing SCP practices. • Reduced dependence on virgin salts, chrome, and imported chemicals through recovery and optimized dosing, • Development of secondary markets for paver blocks and tiles from CETP sludge, bonded leather sheets from trimmings and shaving dust, tallow for soaps, lubricants, and biodiesel, bio-gas methane from fleshing waste.
Environ-mental Impact	• Desalting machines (salt recovery: 3,417 tones/year; water use reduction 66%) • Enzyme-assisted dehairing (sulfide elimination 95%, TSS reduction 30%) • Low-salt tanning (reduced chrome residuals 25%, and toxic effluents 90%) • Smart Water Automated Saving System (SWaSS) – 35–40% water savings • Digital water flow meters (50–65% water savings in crusting) • Accurate weighing systems (reduced chemical use by 10–15%)
Social Impact	• 10% reduction in reported accidents. • Establishment of Medical Centre have helped workers getting primary health benefit. • Locals got jobs in solid waste management including material collection, delivery and dumping for recycling. • 30 Gender sensitization workshops engaged 737 leather workers (99 women and 638 men). • Donated 1550 PPE kits (gloves, masks, aprons, safety shoes, hard hat) to the workers. • Handed over 20 H_2S gas detectors in 20 tanning units. • Implemented General Safety Quotes boards in 10 tanning units.
Climate Benefits	• Reduced GHG emissions by up to 20% per tannery, with examples like Trident Leather cutting 7.03 tCO_2eq annually • Installation of desalting machines reduced water consumption by 783 million litres and carbon emissions by 941.8 tCO2eq annually.
Target Group Engagement	• 169 tanneries and goods manufacturing companies engaged in project activities. • 126 MSME tanneries adopted at least one sustainable tanning practice, with over 348 demonstration sites established for green technologies.
Policy Develop-ment	• Regulatory integration: Engaging with the West Bengal Pollution Control Board (WBPCB) led to desalting machines becoming mandatory for Consent to Operate. • Policy dialogue: Ongoing discussions with MSME Directorate and WBPCB on cluster level Paver block unit set up. DPR submitted to the authorities. • Institutional processes: Collaborating with CLCTA/ILPA as industry bodies that link directly with state-level decision-making. • Demonstration to policy adoption: Showcasing pilot technologies using results to advocate for inclusion in official guidelines.
Europe-Asia Cooperation	• EU & Solidaridad jointly completed the Gender framework under the project, which was endorsed by EU in their website and social media. • 1 Study tour to Italy organized for industry stakeholders • From the findings of EU-Kolkata project, Solidaridad had the opportunity to secure another SWITCH-Asia project in EU-Tamil Nadu

FUNDING

EUR 3,124,992.00
(EU Contribution: 80%)

DURATION

Jul 2020 - Dec 2024

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This impact sheet is developed together with SWITCH-Asia Policy Support Component

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