

Tirupur Industry Conference on Chemical Safety, Sustainability & Regulation

Aug 13, 2026 | Tirupur, Tamil Nadu



Toxics Link
for a toxics-free world

Tirupur Industry Conference on Chemical Safety, Sustainability & Regulation

Tirupur

Date	13 th August 2026
Venue	Ginger Hotel, Tirupur
Time	10:30 AM – 1:30 PM
Lunch	1:30 PM onwards
Organised by	Toxics Link
Theme	Current Chemicals use in Textiles: Challenges and Opportunities

1. Purpose of the Meeting

The conference was convened to address chemical safety, environmental health, and global regulatory frameworks (including UN Global Framework on Chemicals, EU REACH, US CPSIA, OEKO-TEX, and ZDHC) affecting the textile and apparel sector in Tirupur. The primary goal was to bring together industry associations, processing units, regulatory agencies, testing laboratories, research students, and civil society to evaluate ground realities, examine hazardous chemicals (specifically AEOs/APEOs, PFAS, Phthalates, BPA, and Heavy Metals), share Tirupur's progress in Zero Liquid Discharge (ZLD), and identify practical, eco-friendly alternatives for domestic and export manufacturing.

2. Proceedings and Key Discussions

10:30–11:00 AM | Inaugural Address & Keynote Speech – Mr. Satish Sinha, Associate Director, Toxics Link

Mr. Satish Sinha opened the conference by providing a historical perspective on industrial chemical usage. He noted that substances like DDT and mercury were historically celebrated for their utility before scientific evidence revealed their long-term persistence and severe toxicity, leading to global bans. A similar transition is now taking place regarding plastics and complex hazardous chemicals.

He introduced the UN-level Global Framework on Chemicals (GFC), highlighting its objective to establish international safety standards without undermining economic growth. Addressing the Indian context, Satish emphasized that widespread chemical contamination has compromised air, water, and soil quality. Unlike in Europe, where municipal tap water is potable, Indian households rely on RO/UV purification systems at a cost that lower-income populations cannot afford, leaving them exposed to chemical residues.

He clarified that Toxics Link acts as a public-interest entity collaborating with the MoEF&CC, CPCB, and other Govt. organisations. The session's purpose was to collect industry feedback and address double standards where international brands enforce strict restricted substance lists (RSLs) for exported goods while domestic consumers remain exposed to unsafe chemicals such as Nonylphenol (NP) and APEOs. He cited past regulatory phase-outs, such as mercury reduction in CFL bulbs and the 1998 Biomedical Waste Rules, to demonstrate that industry adaptation is achievable through clear technical and regulatory guidance.

Mr. Sinha emphasized that the purpose of the meeting was not simply to determine which chemicals are safe or unsafe, but to create an open platform for stakeholders to share knowledge and experiences regarding chemical use, human-health impacts, ecological impacts, emissions, waste generation and possible safer alternatives. He encouraged the participants to actively contribute their technical knowledge and practical

experience. In conclusion, Mr. Sinha stressed the need for continuous learning, stronger collaborations among government, industry, researchers and civil society, adoption of safer technologies and alternatives, improved standards for domestic products, and alignment with global developments in chemicals and pollution management to ensure protection of human health and the environment.



11:00–11:30 AM | Industry Perspective & Association Remarks – Mr. K. Nagesh, President, Tirupur Dyes & Chemical Merchant Association, Tirupur and Mr. Pon Senthil Natham, Secretary, Tirupur Dyes & Chemical Merchant Association, Tirupur

Mr. Nagesh commenced his talk by detailing the evolution of the textile cluster in Tirupur, highlighting its transformation from modest beginnings into a major industrial hub with an export turnover of over ₹45,000 crore and domestic business of approximately ₹35,000 crore. He explained that the textile industry has undergone significant technological advancement, moving from conventional processing methods, including 18–20-hour dyeing cycles, to modern digital, automated and resource-efficient technologies that help reduce processing time, water consumption and chemical usage. He noted that, with increasing international market requirements, the export-oriented textile sector had progressively adopted global standards and certifications such as **OEKO-TEX**, **bluesign®** and **ZDHC**, along with safer chemical formulations and improved environmental practices. He highlighted Tirupur's significant progress in **Zero Liquid Discharge (ZLD)** and wastewater management, including the operation of around 64 individual treatment facilities and 18–20 Common Effluent Treatment Plants (CETPs), enabling treated water to be recycled and reused in textile dyeing and processing operations. He further noted that newer technologies, including digital printing and automated machinery, are helping reduce water and chemical consumption.

Innovations such as **bio-scouring and enzymatic processing** are also increasingly being explored as alternatives to conventional harsh chemicals such as caustic soda and soda ash. Mr. Nagesh emphasised that chemical manufacturers and suppliers are increasingly providing safer alternatives and certifications to meet international requirements. He stressed the need for stronger collaboration among chemical manufacturers, distributors, textile processors and dyers to facilitate the adoption of safer chemicals and technologies. He particularly recommended that **dyers should be directly involved in future consultations and regulatory discussions**, as their practical experience is essential for understanding the actual use, performance and feasibility of chemical alternatives. He reiterated that the Tiruppur textile industry is willing to work collaboratively with government agencies, regulators, chemical manufacturers and other stakeholders to improve chemical safety, environmental performance and product quality for both export and domestic markets.

Mr. Senthil reflected on the long-term environmental consequences of chemical use, particularly the phenomenon of **bioaccumulation and biomagnification** in ecological food chains. Referring to the historical use of DDT in agriculture, he highlighted how persistent chemicals can accumulate through the food chain and contribute to significant impacts on wildlife, including declines in raptor and vulture populations. He emphasised that the environmental effects of chemicals may not always be immediately visible and that their consequences can emerge over several years or generations. He therefore stressed the principle of **intergenerational equity**, stating that the present generation has a responsibility to manage natural resources and the environment in a manner that allows future generations to inherit a safe and healthy environment. He acknowledged the important role played by government agencies, experts and civil society organisations in increasing awareness of chemical risks and promoting safer chemical management. He appreciated the initiative of bringing different stakeholders together and emphasised the importance of continued dialogue, knowledge sharing and collective action to address chemical safety and environmental challenges.

11:30 AM–12:00 PM | Open forum discussion

An open forum discussion was conducted with participation from representatives of textile processing units, chemical and auxiliary suppliers, testing laboratories, fashion institutes, and other stakeholders.

The discussion commenced with an overview of the evolution of the Tiruppur textile processing sector and the technological improvements adopted over the years. The participants highlighted the transition from conventional, labour- and chemical-intensive processing methods to automated and digitally controlled machinery, resulting in reduced processing time, water consumption, and chemical usage. The progress made by the Tiruppur cluster in wastewater treatment, recycling, and Zero Liquid Discharge (ZLD) systems was also discussed.

The participants subsequently raised concerns regarding the challenges faced by small and unorganised dyeing and processing units in complying with continuously changing Restricted Substances Lists (RSLs) and customer requirements. The discussion also referred to improvements in water quality in the region following the implementation of common effluent treatment and ZLD systems.

The discussion then moved towards emerging international requirements affecting the textile sector. **Mr. Kirthish Jain, LivBio** highlighted developments relating to Digital Product Passports, recycled-content

requirements, PFAS restrictions, biodegradability, and evolving European chemical regulations. The need for Indian textile manufacturers to anticipate such requirements and prepare for changing international market expectations was emphasised.

The participants also discussed the adoption of APEO-free and other safer chemical alternatives. It was observed that although alternatives are available, their adoption at the processing-unit level may be affected by existing standard operating procedures, concerns regarding shade reproducibility, additional costs, and established industry practices. The importance of technical support and demonstration of suitable alternatives was highlighted.

During the discussion on dyeing practices, it was pointed out that darker shades, particularly deep black and other deep shades, generally require higher quantities of dyestuffs, salts, and auxiliaries compared with lighter or pastel shades. The participants suggested that designers, merchandisers, and brands should also be made aware of the environmental implications associated with colour and shade selection so that lower-impact options can be considered wherever technically and commercially feasible.

Mr. Senthil emphasised the importance of learning from the improvements achieved in the Tiruppur cluster and extending safer chemical practices and alternatives across other textile clusters. He also stressed the need for greater awareness and cooperation among industry stakeholders.

Mr. Satish Sinha observed that the absence of a common regulatory framework and uniform requirements may limit the willingness of industries to shift towards safer chemicals, particularly where such changes involve additional costs. He emphasised the need for an appropriate national regulatory framework and standards for hazardous chemicals to establish a level playing field and encourage industries to progressively move towards safer alternatives.

The open forum concluded with a consensus on the need for continued dialogue and collaboration among regulators, industry, chemical manufacturers, testing laboratories, technical institutions, brands, designers, and other stakeholders. The participants emphasised that capacity building, availability of affordable safer alternatives, technical guidance, and appropriate regulatory support would be important for achieving improved chemical safety and environmental performance in the textile sector.

12:00–12:45 PM | Technical Sessions on chemicals in textile –Moderated by: Mr. Piyush Mohapatra, Sr. Program Coordinator, Toxics Link

The technical discussion was opened by Mr. Piyush Mohapatra, introduced the context of the Global Framework on Chemicals (GFC) and highlighted the ongoing developments under the framework. He drew attention to the significance of the textile sector, particularly its extensive and essential use of chemicals across various stages of textile manufacturing and processing. He also highlighted emerging chemical safety concerns in the textile sector, particularly PFAS, and emphasized the importance of identifying and promoting safer chemical alternatives and alternative technologies while recognizing the essential functions served by chemicals in textile production.

The technical session was followed by a presentation by **Dr. Deepak Marathe, Senior Programme Officer, Toxics Link**, on “**Chemicals in Textiles.**” He provided an overview of the chemicals used across different stages of textile production and processing and highlighted concerns associated with hazardous

chemicals, including Nonylphenol (NP) and Nonylphenol Ethoxylates (NPEs), phthalates, formaldehyde, chlorinated paraffins, and PFAS. He particularly highlighted the persistence, bioaccumulation, and potential human health and ecological impacts associated with certain chemicals used in the textile sector.

Dr. Marathe also presented Toxics Link's studies and interventions on Nonylphenol (NP) and Nonylphenol Ethoxylates (NPEs), with a focus on their use in textile processing, detergents, textile products, and their potential release into the environment through wastewater. He discussed the findings from studies undertaken by Toxics Link involving textile products, detergents, and environmental samples collected from different locations and textile clusters in India. The studies examined the occurrence of these chemicals in textile products and environmental matrices and highlighted concerns regarding exposure, persistence, and potential impacts on human health and aquatic ecosystems. The presentation further discussed the regulatory status of NP/NPEs in India and other countries, along with the existing knowledge gaps and the need for strengthened monitoring, research, and regulatory measures. Dr. Marathe emphasised the importance of identifying and promoting safer alternatives to NP/NPEs in textile processing and detergents, and highlighted the need for greater engagement of technical institutions, industry, regulators, and other stakeholders to facilitate the transition towards safer chemical alternatives.

The Question-and-Answer session provided an opportunity for participants to discuss emerging concerns related to textile chemicals, safer alternatives, dye chemistry, wastewater management, PFAS, and the availability of analytical facilities in India. The discussion covered both technological challenges and the need for improved environmental management practices.

Q1. Alternatives to Nonylphenol Ethoxylates (NPEs)

A participant raised the question of whether stronger and more effective alternatives to nonylphenol ethoxylates (NPEs) are available for use as surfactants in textile processing.

It was explained that a number of alternative surfactants are increasingly available globally, including bio-based and non-phenolic formulations. Surfactants based on alcohol and other non-phenolic carbon-chain chemistries may provide potential alternatives. However, the suitability of an alternative needs to be

assessed based on its effectiveness, cost, environmental profile and compatibility with existing textile-processing operations.

Q2. Potential for Bio-based Textile Chemicals

The discussion considered whether bio-based products could replace conventional textile chemicals. It was noted that there is increasing interest globally in bio-based solutions for textile processing. However, textile processes generally require combinations of chemicals, including wetting agents, surfactants and other auxiliaries, and therefore a single bio-based product may not necessarily replace all conventional chemicals.

Enzyme-based processes were identified as one potential approach for achieving more environmentally preferable textile processing. At the same time, their relatively longer processing time and additional cost may present challenges for wider adoption.

Q3. Alternatives to Harsh Treatments for Fabric Preparation

Participants discussed conventional treatments used to remove impurities and improve the wettability of fabrics. While conventional chemical treatments can be effective, some may involve relatively harsh processing conditions.

Enzymatic treatment was highlighted as a potential alternative because it can facilitate fabric cleaning under comparatively milder conditions. However, considerations such as processing time, operational requirements and cost need to be taken into account before large-scale implementation.

Q4. Environmental Concerns Associated with Phenolic Compounds

The discussion highlighted concerns regarding phenolic compounds, particularly those associated with nonylphenol-based chemicals. Their environmental persistence and potential adverse effects make the reduction and replacement of such chemicals an important objective.

Participants discussed the potential use of non-phenolic surfactants, including alcohol-based alternatives, as part of the transition towards safer textile chemical management.

Q5. Azo Dyes and Dark Colours

A question was raised regarding the dyes currently used for dark shades such as black and navy in view of restrictions on certain azo dyes.

It was clarified that the restrictions do not apply to all azo dyes. Rather, specific substances and aromatic amines of concern are restricted because certain dyes can release hazardous amines under specified

conditions. Many reactive dyes, including certain azo-based reactive dyes, may continue to be used provided they meet the applicable chemical safety and market requirements.

Dark shades such as black and navy may be produced using approved dye formulations and, in some cases, through combinations of different dyes.

Q6. Chemical Concerns from Dye Combinations

The possibility of chemical concerns arising from combinations of individually permitted dyes was also discussed. While individual dyes may comply with applicable requirements, interactions during processing, degradation or other chemical transformations may require further consideration.

It was therefore noted that assessment based solely on individual Colour Index numbers may not always provide a complete understanding of the potential chemical risks associated with a particular formulation or combination.

Q7. Use of Dyes Approved for Organic Textile Supply Chains

The terminology surrounding “organic” or “organic-approved” dyes was discussed. It was clarified that a dye permitted for use in products intended for organic textile supply chains is not necessarily a naturally derived or organic chemical.

Such dyes may be synthetic but are permitted because they meet the requirements of the relevant organic standard and associated supply-chain controls. Therefore, the term “organic-approved” should not automatically be interpreted as meaning that the dye itself is naturally derived.

Q8. Role of Salt in Reactive Dyeing

Participants also discussed the role of salt in reactive dyeing. It was explained that salt functions as a process aid that facilitates the interaction between reactive dyes and cotton fibres.

Salt is not simply destroyed during the dyeing process. Modern textile-processing systems increasingly focus on recovery and recycling of process water and, where technically and economically feasible, recovery of resources such as salt. Nevertheless, residual salts and other dissolved substances can remain in process streams and contribute to wastewater characteristics.

Q9. Understanding Zero Liquid Discharge (ZLD)

The discussion also addressed the concept of Zero Liquid Discharge (ZLD). It was emphasized that ZLD should not be interpreted as meaning that the textile process generates absolutely no waste.

The primary objective of ZLD is to prevent the discharge of liquid effluent into the environment through the recovery and reuse of water and concentration of the remaining contaminants into residual or solid

streams. Consequently, parameters such as COD and BOD and other contaminants may still be present within the residual waste generated by the treatment process.

Q10. Relevance of Older Studies

A question was raised regarding whether findings from studies conducted several years ago continue to accurately represent current textile-processing practices.

It was noted that industry practices and chemical formulations can change over time. Chemicals or dyes that were used in the past may subsequently have been restricted, substituted or reduced in use. Therefore, historical studies should be interpreted in their appropriate context, and updated sampling and analytical studies are important for understanding the current situation.

Q11. Beyond Pollution Control: Water Conservation and Groundwater Recharge

Mr. Piyush emphasized that pollution control is only one component of the broader environmental challenge. He highlighted the importance of addressing water conservation and groundwater recharge alongside pollution prevention.

The discussion emphasized the need to restore and maintain water channels, improve catchment areas, protect natural water-flow pathways and enhance the recharge of ponds, lakes and groundwater systems.

Long-term environmental sustainability therefore requires not only preventing pollution but also ensuring that local water resources are replenished and protected.

Q12. Concerns Regarding PFAS in Textiles

Mr. Piyush also raised the issue of per- and polyfluoroalkyl substances (PFAS) in textile products. The discussion noted that PFAS represents a very large group of chemicals and that their use in textiles has received increasing international attention.

PFAS may be associated with certain textile applications requiring water, oil or stain resistance. Reference was also made to studies examining textile products available in the market, including branded products, where PFAS-related concerns have been identified.

The discussion highlighted the need for increased monitoring, transparency in textile supply chains and the development and adoption of safer alternatives.

Q13. Availability of PFAS Alternatives

Participants discussed whether alternatives to PFAS-based textile treatments are available. It was noted that PFAS-free alternatives are increasingly being developed and adopted.

The appropriate alternative depends on the performance requirements of the textile product, including water repellency, oil repellency, durability and the intended end use. Continued research and technology development are therefore important to enable the transition towards PFAS-free textile finishing.

Q14. Challenges in Testing Textile Chemicals

The discussion identified access to appropriate laboratory facilities and advanced analytical capabilities as major challenges in monitoring hazardous chemicals in textiles. Testing for emerging contaminants can be technically demanding and expensive. While export-oriented textile manufacturers may undertake testing

to meet international buyer and regulatory requirements, smaller manufacturers may face difficulties due to the cost and availability of specialised analytical facilities.

Q15. Capacity of Indian Laboratories

The final discussion focused on whether Indian laboratories have the capacity to analyse emerging contaminants in textile products.

It was noted that India has laboratories with significant analytical capabilities, particularly those supporting export-oriented industries. However, challenges remain with respect to the availability, accessibility and cost of specialised testing for emerging contaminants.

Strengthening laboratory infrastructure, analytical expertise and access to affordable testing facilities would support more effective monitoring of chemicals such as PFAS, NPEs and other substances of emerging concern.

Technical Presentation by **Dr. G Jagathesan, Lab Manager, Eurofins Lab, Tirupur**

The **Dr. G Jagathesan** presentation focused on current chemical use in the textile, leather and consumer-product industries, associated risks to human health and the environment, international regulatory requirements, and approaches for controlling chemical risks throughout the supply chain. The presentation introduced Eurofins' global testing capabilities, including facilities in India and other major textile-producing countries, and explained that its laboratories conduct physical, mechanical, colour-fastness and chemical testing, including Restricted Substances List (RSL) testing. The presenter explained that RSLs are used to identify and control chemicals that are restricted or prohibited in finished products, while Manufacturing Restricted Substances Lists (MRSLs) focus on controlling hazardous chemicals at the manufacturing and chemical-input stage. The presentation highlighted major areas of chemical concern in textiles and leather, including APEOs/NPEs, azo dyes and aromatic amines, formaldehyde, phthalates, heavy metals, PFAS/PFCs, flame retardants and bisphenols. It was noted that chemical failures can originate from raw materials, dyes, pigments, printing chemicals, surfactants, coatings, plastics, metal components and processing equipment. Particular attention was given to APEO/NPE contamination, which may arise from scouring agents, wetting agents, detergents and surfactants. The presentation highlighted the growing importance of PFAS/PFCs, particularly in textile finishes providing water, oil and stain resistance. The presenter emphasised that chemical compliance should be addressed throughout the production process, including raw-material procurement, dyeing, printing, washing, finishing, embroidery and contact with machinery, rather than relying only on final-product testing. The presentation concluded by emphasising the importance of a systematic chemical-management approach covering the entire supply chain, stronger raw-material controls, safer chemical substitution, regular testing and awareness among suppliers and manufacturers. Such measures can help industries meet international regulatory and buyer requirements while reducing risks to consumers, workers and the environment.

12:45–1:30 PM | Panel Discussion, Recommendations & Way Forward

The panel discussion focused on the challenges associated with hazardous chemical use in the textile sector and the need for stronger collaboration among industry, regulatory authorities, testing laboratories, researchers, civil society and other stakeholders. The discussion highlighted that several hazardous

chemicals continue to be used despite the availability of safer alternatives. Chemicals of concern discussed during the session included APEOs/NPEs, PFAS, phthalates, BPA, formaldehyde, heavy metals and other hazardous substances. Participants noted that alternatives are available for several of these chemicals, but their wider adoption is sometimes constrained by differences in technical performance, cost, availability, lack of awareness and the absence of clear and harmonized standards.

Mr. Satish Sinha highlighted the importance of clearly understanding the respective roles of regulatory and policymaking institutions in relation to chemical management. He explained that environmental regulatory authorities primarily focus on environmental parameters such as effluent quality, wastewater treatment, emissions and compliance with prescribed environmental standards. The regulation or restriction of a particular chemical substance, however, may fall within the mandate of the relevant policymaking authority or ministry, depending on the nature and application of the chemical. He emphasized that environmental regulators are responsible for monitoring and controlling the environmental releases associated with industrial activities, while broader chemical restrictions and product-level requirements require appropriate policy and regulatory frameworks. This distinction was considered important for ensuring that recommendations on hazardous chemical management are directed to the appropriate authorities.

Mr. Satish Sinha further emphasized the need for clear and consistent standards for chemicals used in textile manufacturing and textile products. He noted that textiles are not only manufactured for domestic consumption but are also widely traded internationally, making harmonized approaches important. The discussion highlighted the need to consider the potential impact of chemicals present in dyed, printed and finished textiles on human health, particularly where products come into direct or prolonged contact with the skin. Appropriate standards and testing requirements could provide greater assurance regarding the safety of textile products and improve transparency for consumers and manufacturers.

The panel also discussed the continued use of hazardous chemicals despite the availability of alternatives. Mr. Nagesh highlighted that safer alternatives are available for several chemicals of concern and referred to BPA as an example of how research, evidence generation and stakeholder engagement can contribute to regulatory action. He emphasized that the availability of alternatives needs to be supported by greater awareness, appropriate standards and evidence demonstrating their technical and economic feasibility. The discussion recognized that substitution should be based on a comprehensive assessment of hazard, performance, environmental impact, availability and cost.

Industry representatives discussed the practical challenges associated with replacing conventional dyes, colours, auxiliaries and other chemicals. Several alternative dyes and auxiliaries have been tested, but some alternatives do not yet provide performance equivalent to conventional products. In certain cases, alternatives were reported to achieve approximately 50–60% of the desired performance, demonstrating the need for further research, formulation improvements, process optimization and industrial-scale trials. The panel also noted increasing interest in natural dyes and other safer alternatives in response to growing international market requirements, while recognizing challenges related to consistency, availability, colour performance, scalability and cost.

The panel emphasized the importance of establishing a National Priority Chemical List focusing on high-risk substances relevant to Indian textile manufacturing, including APEOs, PFAS, phthalates and BPA. Such a list could provide a common reference for industry, chemical suppliers, testing laboratories and

policymakers and help prioritize chemicals for substitution, monitoring and further research. The panel also emphasized the need to identify practical alternatives and support industries in validating and adopting safer formulations.

The need for support to MSMEs and small-scale dyeing and processing units was also highlighted. Smaller units may face financial, technical and knowledge-related barriers when adopting safer chemicals. The panel therefore discussed the importance of technical assistance, access to alternative formulations, training and capacity building, testing facilities and support for validation and testing costs. Strengthening the capacity of MSMEs would help ensure that safer chemical practices are implemented throughout textile clusters.

The panel also emphasized chemical transparency and supply-chain traceability. Chemical suppliers should provide reliable and verified Safety Data Sheets (SDS), along with adequate information on chemical composition, hazards and intended applications. Textile manufacturers should maintain chemical inventories, verify suppliers and strengthen traceability from the procurement of chemicals through production and finished products. Such measures would enable manufacturers to identify chemicals of concern at an early stage and make informed decisions regarding substitution.

The role of testing and verification was discussed as an important component of preventive chemical management. Participants emphasized that chemical testing should not be limited to finished textile products but should also cover relevant raw materials, dyes, pigments, auxiliaries, printing chemicals, coatings and other inputs. A preventive approach would allow chemical risks to be identified and addressed earlier in the manufacturing process.

Another important issue raised during the panel discussion was microplastic pollution from textiles. Mr. Nagesh explained that synthetic textile fibres can release microplastic particles and fibres during washing, which may subsequently enter wastewater systems and aquatic environments. Conventional wastewater treatment systems may not completely remove these particles. The panel recognized microplastic pollution as an emerging environmental and health concern and noted that further research is required to understand its long-term impacts and develop effective measures for prevention, filtration and control.

The panel also discussed the need to balance safety, regulatory requirements and product performance when evaluating safer alternatives. It was emphasized that safety requirements should not be compromised, while alternatives must also meet the functional and quality requirements of textile products and remain commercially viable. Standardized testing, pilot-scale trials and industrial demonstrations were considered important for assessing whether alternatives can effectively replace conventional chemicals under actual manufacturing conditions.

A key proposal emerging from the panel was the development of a “Tirupur Model for Safer Chemistry.” The proposed approach would bring together dyeing and processing associations, chemical suppliers, testing laboratories, research institutions, brands, industry representatives and civil society organizations to identify priority chemicals, evaluate safer alternatives, undertake pilot projects and assess technical and

economic feasibility. Successful interventions could be documented and used to develop practical guidance for industry and subsequently replicated in other textile clusters.

The panel emphasized the importance of documenting successful industry practices and developing evidence-based case studies. Information on safer alternatives, costs, technical performance, environmental benefits, wastewater improvements and overall effectiveness should be systematically documented. Such evidence could demonstrate the feasibility of safer chemical substitution and provide useful inputs for policymakers in developing appropriate standards and regulatory measures.

In the concluding part of the discussion, Mr. Satish Sinha emphasized the importance of a coordinated approach in which environmental regulation, chemical policy, product safety, industry practices and scientific research complement one another. The panel recognized that effective chemical management cannot be achieved through regulation alone and requires cooperation among industry, chemical suppliers, testing laboratories, researchers, civil society and policymakers.

1:30 PM | Concluding Remarks & Adjournment – Mr. Satish Sinha

Satish Sinha thanked the participating associations, technical experts, and researchers. He commended Tirupur's ZLD achievements as a national benchmark and affirmed Toxics Link's commitment to presenting the cluster's insights and recommendations to central policy-makers in New Delhi. The meeting adjourned at 1:30 PM for lunch.

3. Key Takeaways

- **Dual-Market Standards:** Export textiles manufactured in Tirupur comply with strict global restricted substance lists (RSLs), whereas domestic market garments frequently contain restricted chemicals like Nonylphenol due to a lack of uniform national domestic limits.
- **Proof of ZLD Efficacy:** Tirupur's Zero Liquid Discharge infrastructure has successfully reduced ambient river contamination (yielding non-detectable NP levels in the Noyyal River in recent testing) and enabled high water and salt recovery rates.
- **Technical & Cost Barriers for MSMEs:** Smaller processing units require accessible chemical alternatives, updated Standard Operating Procedures (SOPs), and cost-effective screening to transition away from APEOs and PFAS without losing color quality or margin.
- **Holistic Value-Chain Engagement:** Environmental chemical reduction requires educating fashion designers and merchandisers to select lighter color palettes that lower dye, salt, and auxiliary consumption.