Regional Round Table on "National Implementation Plans: Research Needs and Opportunities in Asia"

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CSIR-NEERI: Introduction

- **CSIR-NEERI was established** in Nagpur in 1958 as Central Public Health Engineering Research Institute (CPHERI), due to Jaundice epidemic.
- **SMT. Indira Gandhi**, the then Prime minister of India, rechristened the Institute as National Environmental Engineering Research Institute (NEERI) in 1974.
- **NEERI** is a pioneer laboratory in the field of environmental science and engineering and part of Council of Scientific and Industrial Research (CSIR).

MANDATE

- To Conduct R&D in Environmental Science and Engineering.
- To Participate in CSIR Thrust Areas and Mission Projects to Develop Environmentally Sustainable Technologies.
- To Render Assistance to Industries & Government Bodies to Mitigate Environmental Pollution.
- To Interact and Collaborate with Academic and Research Institutions on Environmental Science and Engineering for Mutual Benefit.

MISSION

NEERI would continue to strive for providing Innovative and effective solutions for Environmentally Sustainable Development and to help Government, Industry and the society, especially the 800 million underprivileged people of India.

VISION

Leadership in Environmental Science and Engineering for Sustainable development.

CSIR-NEERI: ORGANISATIONAL STRUCTURE

DG, CSIR, New Delhi

Zonal Centre at
- Chennai
- Delhi
- Hyderabad
- Kolkata
- Mumbai

DIRECTOR

Support Divisions

BDPMD | PRMD | SEAF | KRC | QMSD

1. AIR QUALITY MANAGEMENT

2. Water & WASTE WATER MANAGEMENT

3. WASTE MANAGEMENT

SCRC-India

4. ENVIRONMENTAL IMPACT ASSESSMENT

5. ENVIRONMENT & ENERGY SCIENCES & TECHNOLOGY

Environmental Processes and Materials

Energy & Resource Management

Environment Biotechnology Genomics & Health

- Total No. of Scientists: 150
- Total Staff including Scientific, Technical and Administrative: 250
- COP 5 (2011) endorsed CSIR-NEERI as “Stockholm Convention Regional Centre (SCRC) for Asia Region”.

CSIR-NEERI: Journey at a Glance

1958-1974

- Focus: water and wastewater.
- 135+ major activities, mainly including monitoring and other field studies.
- WHO Nomination for community water supply and waste disposal
- Rheological survey of the Yamuna river between Wazirabad and Okhla at Delhi (1958-59)
- Significance and value of biological indices of water pollution (1958-59)
- Sewage Farming (1959-60)
- Activated carbon from saw dust (1960-61)
- Activated sludge process – Air diffuser (1961-62)
- Portable water demineralizing unit (1961-62)

1975-1986

- Focus shifted to technologies and solutions
- Air quality monitoring started from Kolkata and Taj Mahal during 1975-76
- Utilization of pulp mill effluent for irrigation (1977-78)
- Development of Rapid Method for Detection and enumeration of faecal coliform in wastewater (1977-78)
- Treatment & disposal of wastewater from fertilizer industry (1979-80)
- Impact of fugitive and stack emissions from selected industries on neighbourhood air quality (1981-82)
- Development of instruments for environmental monitoring (1984-85)

1987-2001

- Pioneering studies of EIRA, Carrying Capacity, LCA, EIA of Antarctica
- Industrial/field demonstration of technologies- including CETPs, Catalytic converter, mine dump restoration etc.
- Advanced instruments like smoke-meter, high volume sampler, water quality monitoring kit, arsenic detection kit
- Landmark SC judgement on Taj Trapezium based on NEERI report

2001 Onwards

- CSIR Plan projects undertaken on Industrial waste minimisation, and other areas.
- Environmental technologies including electro-Defluoridation, Phytorid, iron removal, NEERJHAR, HRTS, Hazardous waste disposal.
- CETPs for leather industry, International projects with USEPA, EU, JICA, WHO, UNICEF etc.

Survey of tannery wastes at Kanpur (1963 –64)

Oxidation Ditch (1969 -70)

Disinfection tablets (1976 -77)

Treatment and disposal of wastewaters from fertilizer industry (1979 -80)

Evaluation of rural water supply (1981-82)

Aeration lagoon

EDF

WAYU

PHYTORID

CSIR-NEERI: International Projects with UN, WHO, IPCC

- Designated as WHO Collaborative Centre for Water and Sanitation
- CSIR-NEERI is designated Stockholm Convention Regional Centre for South Asia (UNEP)
- Water safety plan for urban water supply, rural water supply, healthcare facilities, and sanitation safety plans (WHO)
- Development and promotion of non-POPs alternatives to DDT (UNEP)
- Green House Gas Emission Inventory from Waste Sector for India (IPCC)
- Awareness for Industries and Preparation of India Specific Mercury inventory under Minamata Convention (UNDP)
- Water Quality Surveillance and other activities (UNICEF)

37 POPs listed in the Stockholm Convention (2025)

Chemical	Pesticides	Industrial chemicals	Unintentional production	Annex
DDT	+			B
Aldrine, Dieldrine, Endrine Chlordane,	+			A
Chlordecone, Toxaphene, Alpha-, Beta-,	+			A
Gamma-HCH, Endosulfan, Heptachlor,	+		By-product of lindane	A
Mirex , Pentachlorophenol (PCP), Dicofol,	+			A
Methoxychlor, Chlorpyrifos	+	+		A
Commercial PentaBDE, Commercial		+		A
OctaBDE (Hexa/HeptaBDE), Commercial		+		A
DecaBDE, Hexabromobiphenyl (HBB)		+		A
Hexabromocyclododecane (HBCD)		+		A
Perfluorooctane sulfonic acid (PFOS),		+		A
its salts and PFOSF	+	+		B
PFOA & PFHxS and related chemicals				
LC-Perfluoroalkyl acids		+		A
Short chain chlorinated paraffins (SCCP),		+		A
Medium chain CPs(MCCP)				A
UV328, Dechlorane Plus				A
PCB, PeCBz, HCB, PCN, HCBD	+	+	+	A/C
PCDD, PCDF			+	C

Courtesy: Roland Weber

India NIP Update Project (GEF ID: 10978)

The NIP Development and Update Process

- The three-tier methodology

- **Tier 1: Initial assessment**

- Desk study. Compilation of publicly available information. Identify key stakeholders for each POP/group/industrial sector.

- Developing countries often develop initial assessments that are not sufficiently detailed and precise to plan the SC implementation or to identify global environmental benefits for the development of future GEF projects to support in-country implementation of NIPs.

- **Tier II: Main inventory**

- The objective is to generate data on the major industrial sectors through interviews and questionnaires to the national stakeholders, and further identify missing information. The poor rate and quality of answers to questionnaires from key stakeholders is usually the main obstacle to developing the Tier II inventory.

- **Tier III: In-depth inventory**

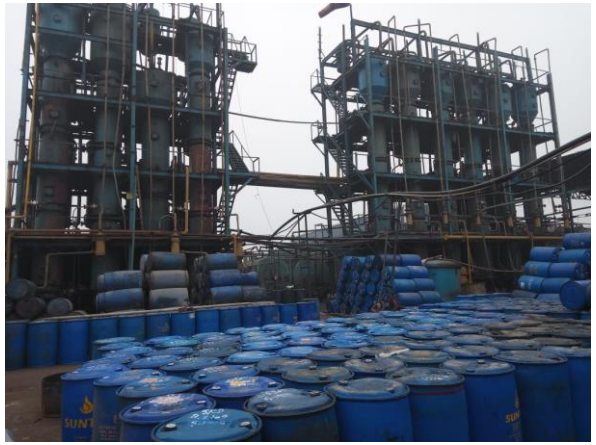
- This includes sampling and analysis. In most cases, developing countries have limited or no capacity to conduct in-depth inventories of POPs.

Content/Data Requirement of the National Implementation Plan

- Production, import/export details, estimated use, stockpiles
- Concentrations in environmental compartments, products and waste
- Sector-wise consumption of POPs e.g., Agriculture, Construction, Automotive, Textile, Plastic, Electric and Electronic, Waste incineration, Rubber, Paint, Leather etc.
- Contaminated site assessment
- Human health implications
- Assessment of alternatives
- Management/action plan to reduce emissions (BAT/BEP)
- Socioeconomic impacts
- Synergies with Basel, Rotterdam, Minamata and SAICM conventions/treaties
- Integration with National developmental policies, SDG, etc.
- Prioritized action plans for POP management

Industrial POPs: Data Collection, Sampling and Monitoring

Inventory of Chlorinated Paraffin (CPs)



No. of CPs manufacturing Industries surveyed: 30
Total no. of Industries: ≈ 30

Pulp and Paper Industries

No. of pulp and paper Industries surveyed: 10
Total no. of Industries: ≈ 25

POPs in Automobile Sector

No. of vehicle scrapping facilities surveyed: 15
Total no. of RVSFs: ≈ 100, Informal: ≈ 25

POPs in Textile Sector

No. of Textile Industries surveyed: 7
Total no. of Industries: ≈ >1 lac

POPs in Waste Electric and Electronic Equipment (WEEE)

No. of WEEE recycling units surveyed: 85
Total no. of Industries: ≈ 400

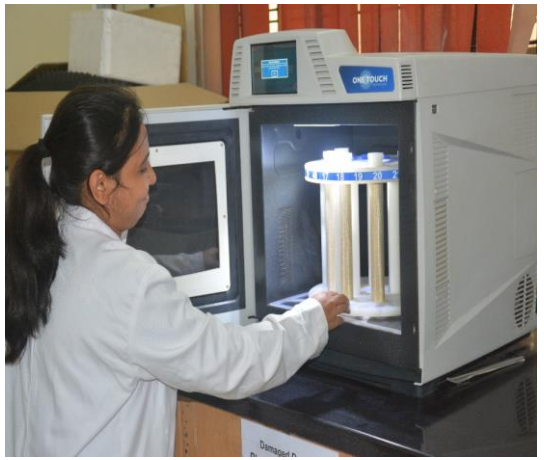
POPs in Construction and Demolition Activities

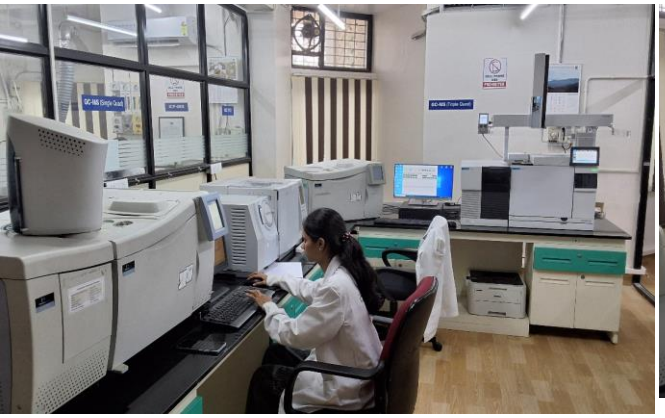
No. of Construction material industries visited: 15
(Polystyrene, PUR, PVC, Adhesives, Sealants etc)

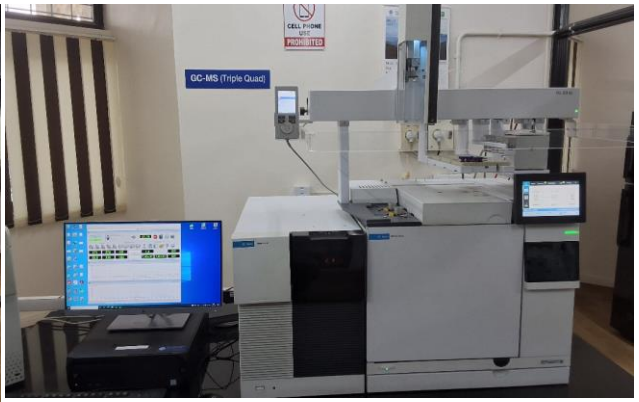
Challenges

- Lack of country capacity
- Lack of interest/awareness among stakeholders
- Poor participation of stakeholders in meetings
- Competing interests among stakeholders e.g., Environmental protection *Vs* Promotion of Industry/manufacturing/Economy
- Lack of studies linking exposure to chemicals and adverse health outcomes
- Reluctance to share data on production/import/export of chemicals by the line Ministries/Depts.
- POPs chemicals in products e. g. textiles, plastics, electric and electronic goods, paint, consumer goods etc. –Industry apprehension/non-cooperation
- Changing priorities/policies

SCRC-POPs Laboratory



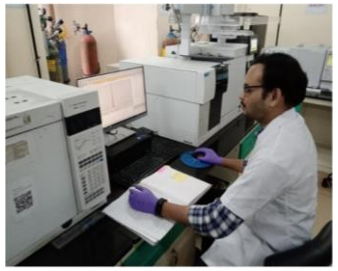




Recent Publications (2025)

1. Singh, I., Kanade, G. S., & **Kumar, A. R.** (2025). Volatile methylsiloxanes in beauty and personal care products sold in India and human exposure assessment. *Science of The Total Environment*, *975*, 179295.
2. Khare, A, Jhadav, P, Vaidya, A N, **Kumar, A R.** Non-essential use of benzotriazole ultraviolet stabilizers in single-use plastics manufactured in India: An avoidable class of plastic additives, *Sci Tot Environ,* 2025, 968, 178916. **IF: 8.2**
3. Singh, I., Jadhav, P, **Kumar, A.R.** Occurrence, Fractionation, and Human Health Risk Assessment of Potentially Toxic Metals in Urban Soils of Different Land use Types. *Water Air Soil Pollut*, 2025, 236, 183-205. **IF: 3.8**
4. Prajapati, A., Jadhao, P., & Kumar, A. R. (2025). Atmospheric microplastics deposition in a central Indian city: Distribution, characteristics and seasonal variations. *Environmental Pollution*, *374*, 126183. **IF: 7.6**
5. K Ronnie Rex, S Subramani, **A R Kumar,** (2025) Polychlorinated Biphenyls in India: Fading Legacy or Persistent Threat? A Review on Environmental Contamination, Source Dynamics, Exposure Risks, and Regulatory Commitments under the Stockholm Convention, J Haz Mater (Under review).

List of PhD Scholars in SCRC-India



Enhanced Electrokinetic Remediation Using CaMnO3 Catalysed Peroxydisulfate Activation for Polychlorinated Biphenyl (PCBs)-Contaminated Soil

Environmental Fate, Distribution and Health Risk Assessment of Emerging Persistent Organic Pollutants (e-POPs)

Comprehensive Assessment and Source Apportionment of Atmospheric Dioxins and Furans in Major Urban and Adjacent Rural Regions of India Using Passive Air Sampling and Receptor Modelling

Environmental Dynamics of Microplastics and Polyaromatic Hydrocarbons in Road Dust

Treatment Of Chromium And Mercury Bearing Hazardous Industrial Waste Using Modified Biochar

An estimation of daily intake of phthalates in humans and health risk assessment

Ongoing Research within the GEF-funded NIP Update Project

1. Chlorinated paraffin inventory in different plastic products
2. Assessment of PCBs contamination in transformer storage yards
3. Monitoring of hazardous chemicals in recycled plastic pellets to inform the policymakers to frame regulatory standards
4. Emerging contaminants and POPs in consumer products to help the Bureau of Indian Standards (BIS) in setting standards
5. Migration Hazardous chemicals from kitchenware
6. Non-essential additives in single-use plastics
7. Assessment of halogenated flame retardants from automobile parts in association with the Society of Indian Automobile Manufacturers Association (SIAM)
8. Assessment of POPs in ship-breaking yard, Alang, Gujarat
9. Background POPs levels in ambient air of urban and rural areas
10. Assessment of UV-Stabilisers in Sportswear
11. Emerging POPs: Cyclic siloxanes in cosmetics

Thanks for your attention…