Council of Scientific & Industrial Research

National Environmental Engineering Research Institute

Ministry of Science and Technology, Government of India

Charting the Future of Environmental Sustainability & Innovation

As we stand at the critical intersection of environmental challenges and technological innovation, CSIR-NEERI continues to be a beacon of hope and progress in India's sustainability journey. Our institute has long been committed to transforming environmental research into tangible solutions that address the most pressing ecological challenges of our time.

Over the past 67 years, CSIR-NEERI has played a transformative role in shaping environmental policies, driving sustainability, and enhancing societal well-being through research, technological innovations, and ecosystem-based solutions.

CSIR-NEERI is dedicated to addressing dynamic and contemporary environmental challenges through scientific research, technology development, and consultancy services. Its key focus areas include environmental monitoring, pollution mitigation, waste management, climate change, impact assessments, and ecosystem services. The institute actively contributes to national priority programs, including the Swachh Bharat Mission, clean air, river rejuvenation initiatives, Viksit Bharat, sustainable waste management strategies, and carbon sequestration programs. The institute is associated with various international programs and conventions.

CSIR-NEERI emphasizes decarbonization and nature-based solutions to support sustainability. Through an interdisciplinary approach, it integrates sustainable practices, resource efficiency, circular economy initiatives, and green innovations to advance environmental and climate goals. Through collaborative research with government agencies, industries, and international organizations, the institute develops innovative, science-driven solutions to mitigate environmental impact while fostering economic and social progress.

CSIR-NEERI contributes to rural development by implementing water purification, waste management, and clean fuel solutions to enhance health. The institute prioritizes knowledge dissemination and skill development through capacity-building programs, empowering professionals, students, policymakers, and industry stakeholders. These initiatives enhance expertise in environmental management, regulatory compliance, and emerging green technologies.

With a diverse team of dedicated scientists and technical experts, CSIR-NEERI remains at the forefront of sustainable environmental solutions, working toward a cleaner, greener, and more resilient future.

Dr. S Venkata Mohan
Director, CSIR-NEERI

CSIR-NEERI's Vision

Leadership in Environmental Science and Engineering for Sustainable Development

CSIR-NEERI's Mission

CSIR-**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.

History and Evolution

Establishment: Founded in 1958 as the Central Public Health Engineering Research Institute (CPHERI) in Nagpur, Maharashtra, under CSIR.

Building a Strong Foundation (1960s) In its early years, the institute pioneered low-cost water treatment technologies, such as the Nalgonda Technique, developing oxidation ditches for sewage treatment, and biogas generation, laying its foundation in environmental research.

From CPHERI to NEERI: The Opening of New Vistas

During a visit on 3rd January 1974, the then Hon'ble Prime Minister of India, observed:

"This Institute is doing valuable work and its present name is a bit limiting in the sense that people think that it is concerned only with certain small problems. Now that it is branching out and taking into the range of its activities much larger problems, it should now be called 'National Environmental Engineering Research Institute (NEERI).'"

-62nd Governing Body Meeting, 1974

Key Milestones

1958...

Establishment of CPHERI in Nagpur under CSIR

Focus on water supply, sewage disposal and communicable diseases.

Research on water and wastewater treatment, potable water disinfection, and heavy metal removal.

1960s...

Development of low-cost water treatment technologies, including the Nalgonda Technique.

Innovations in well disinfection, chlorination, and cartridge decontamination.

Design of water treatment plants, automatic air sampling devices, and mercury thermoregulators.

1970s...

Renamed as NEERI from CPHERI in 1974.

Launch of India's first air pollution monitoring network.

Recognition as a WHO Collaborating Centre for water and waste management.

Development of low-cost air samplers, multi-gas kits, respirable dust samplers, and membrane filters.

Establishment of defluoridation pilot plants and WHO regional air pollution reference studies.

1980s...

Basic engineering designs for wastewater treatment (CETPs, ETPs and STPs).

Formulation of industrial emission standards.

Development of bioremediation, catalytic converters, and cleaner technologies.

Wastewater treatment for pulp, paper, and fertilizer industries.

Introduction of aerated lagoons, sludge drying beds, and risk assessment models.

1990s...

Indigenous catalytic converters for vehicular emissions & expansion of air quality monitoring to 10+ cities.

Pioneering EIA studies (Antarctica, Taj Trapezium, industrial sectors) & impact assessment of the Ganga Action Plan.

Development of portable water testing kits, smokemeters, and sequential air samplers.

Research on biomethanation, source apportionment, & groundwater studies.

Assessment of Environmental Carrying Capacity.

2000s...

Advancements in waste-to-wealth, zero liquid discharge (ZLD), bioremediation, and chemo-remediation.

Partnership with USEPA for drinking water monitoring.

Research on CO⊠ sequestration, artificial photosynthesis, biodegradation modeling, and nano-structured materials - zeolites.

Carrying capacity-based planning, genotoxicity & health assessments, and RS-GIS applications and phytoremediation, and source apportionment studies.

2010s...

Recognition as Stockholm Convention Regional Centre (SCRC) on POPs for Asia Region.

National Clean Ganga Mission, river rejuvenation, and development of decentralized wastewater treatment systems.

Innovations in waste-to-energy and drain treatment technologies.

R&D and demonstration of Reduced-emission firecrackers.

Eco-rejuvenation of degraded lands, microbial CO_2 mitigation, and bioplastics from waste.

Full-scale mercury site remediation using soil washing & thermal retorting.

Research on environmental noise monitoring, and development of a real-time noise monitoring app.

Activities on Strategic urban planning, LCA studies and environmental externalities assessment.

2020s...

Rapid RT-PCR testing, Innovative Saline Gargle RT-PCR method for COVID-19, AI/ML applications, and climate vulnerability assessments.

UAV-assisted environmental monitoring, critical zone studies, and net-zero carbon strategies.

CCUS research on CO_2 capture, algal sequestration, and hazardous waste encapsulation.

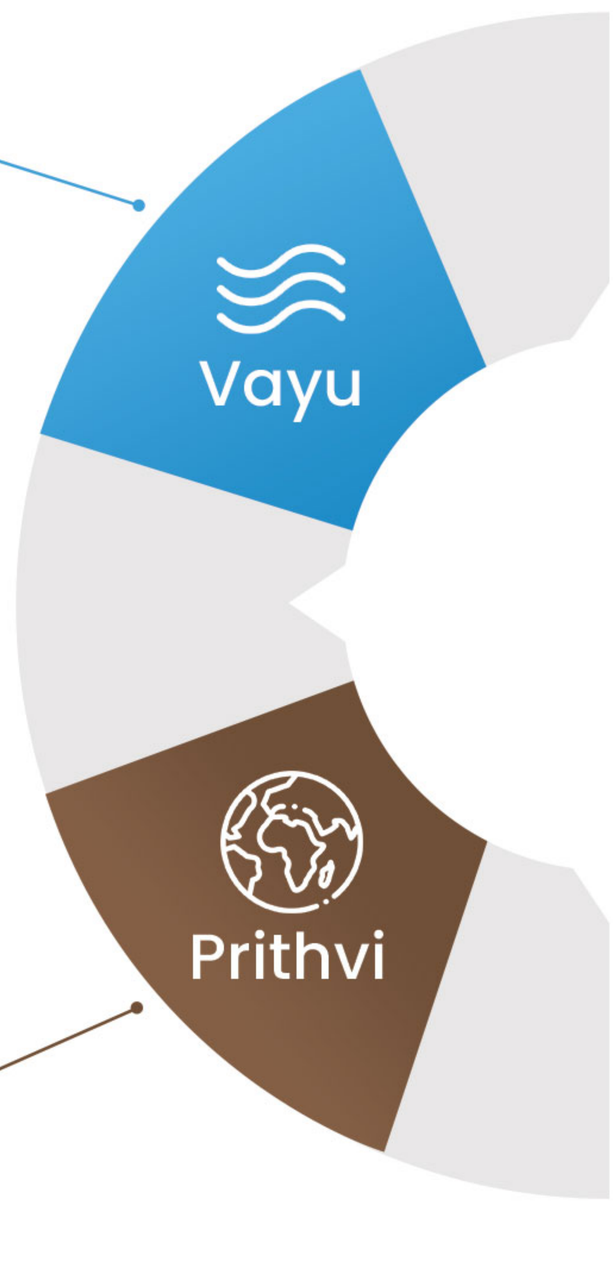
Advanced recycling technologies, circular economy models & frameworks, sustainable urban planning, and carbon finance.

Establishment of Center of Excellences and Specialized Research Centers.

Integrated Spectrum of Environmental Solutions at CSIR-NEERI

Air

- Ambient & Indoor Air Quality Monitoring
- Stack & Fugitive Emission Monitoring
- Mercury, Dioxin-Furan & Bio-Aerosol Monitoring
- Secondary Pollutants, Atmospheric and Noise Studies
- Emission Inventory & Source Characterization
- Source Apportionment of Pollutants
- Dispersion, Receptor & Chemical Transport Modeling
- Statistical Data Analytics & Predictive Modeling
- Airshed Mapping and Management
- Air Pollution Control System Design & Evaluation



- Environmental Impact & Carrying Capacity Assessment
- Climate Vulnerability, GHGs & Carbon Footprint Assessment
- Environmental Compliance, Due Diligence & Audits
- Environmental Policy Analysis, Reporting and Advocacy
- Resource Efficiency & Circular Economy

Earth

- Landuse Planning and Management
- Biodiversity and Ecosystems Assessment
- MSW (Municipal Solid Waste) Characterization & Management
- Plastic, E-Waste, Hazardous & Biomedical Waste Management
- Waste Minimization, Treatment, Upcycling & Valorization
- Contaminated Site & Degraded Land Remediation
- TSDF (Treatment, Storage and Disposal Facility) Design & Monitoring
- Bioreactor Systems Design

Water

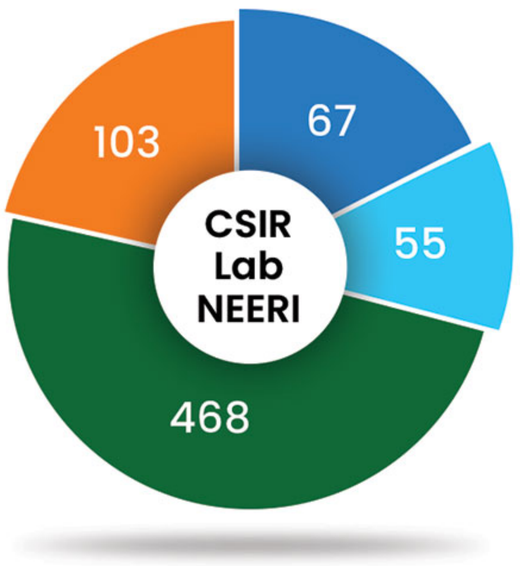
- Water and wastewater Monitoring & Analysis
- Groundwater Quality Assessment & Hydrogeological Studies
- Water Safety, Security & Adequacy Assessment
- Quantitative Chemical/Microbiological Risk Assessment
- Localized & Industrial/Municipal Water Treatment Technologies/Processes
- Wastewater Treatment Plant Design, Upgradation & Re-engineering
- River, Lake, Canal & Wetland Conservation/Rejuvenation
- Fate and Transport Modeling of Pollutants
- Urban Flood Modeling & Management
- Watershed & River Basin Management

- Damage Compensation, Risk and Hazard Analysis
- Life Cycle Assessment & Sustainability Reporting (incl. ESG)
- Health Risk, Toxicity, Environmental Epidemiology & Occupational Health
- Environmental Genomics, Biotechnology and Virology
- Environmental Intelligence (Digital Twin)

Energy

- Biomass/Waste Combustion, Gasification & Pyrolysis
- Solar Thermal & Distillation Systems
- Catalysts: Zeolites, Perovskites, Metal Oxides, Fuel Cell Intermetallic
- Hydrogen Storage via Liquid Organic Hydrides
- Perovskite-based Solar Cells
- Carbon Capture, Utilization & Sequestration
- Chemical Looping Combustion
- Clean Combustion Device (Informal/Residential Sector)

Resource Base:



Human Resource

- **Total Staff - 468**
- **Scientific Staff - 103**
- **Technical Staff - 67**
- **Administration Staff - 55**

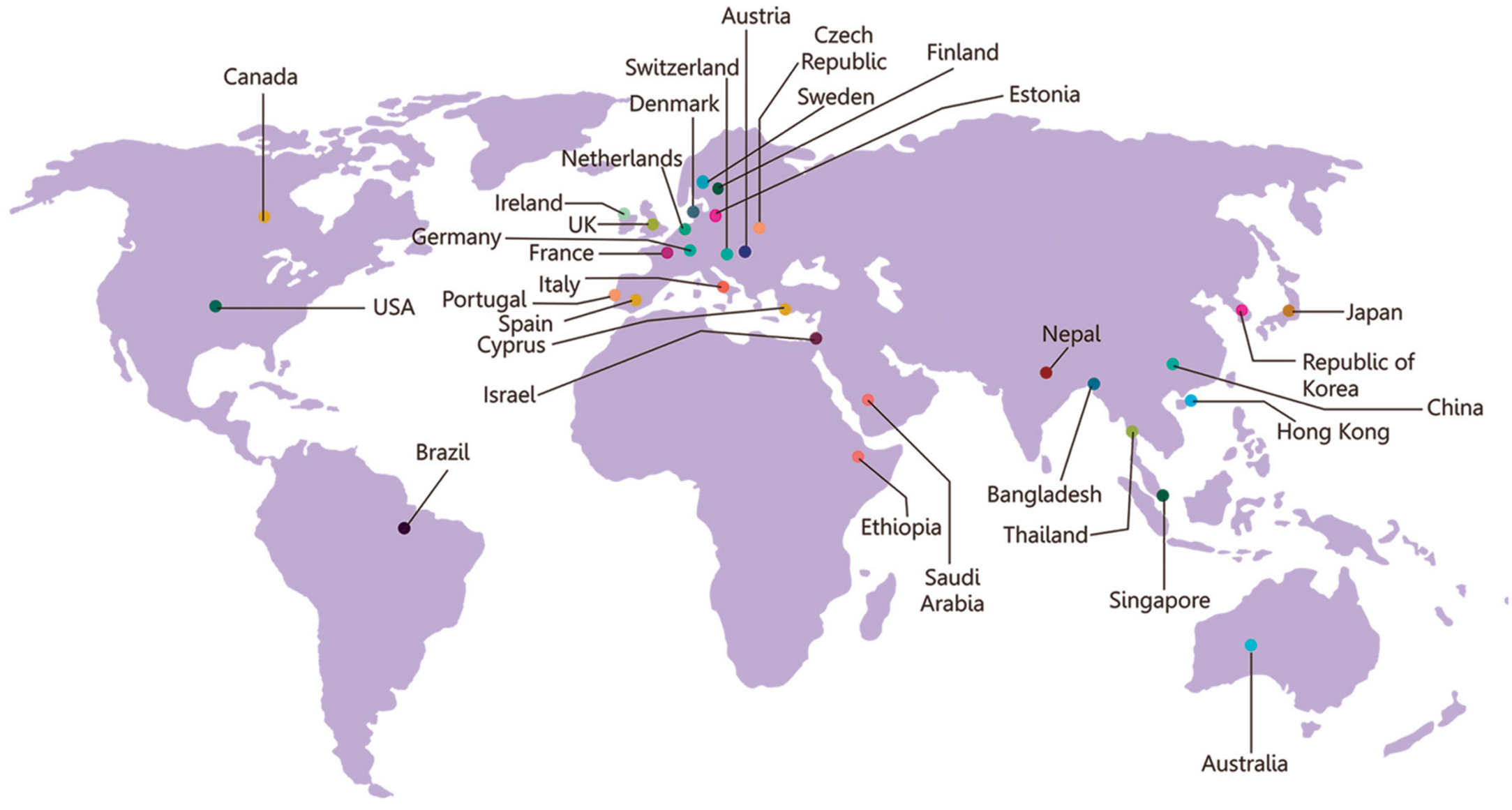
Supported by a team of dedicated research Ph.D. scholars, project associates and fellows.

R&D Infrastructure

Major Instruments

HRGCMS	UV-Vis Spectrophotometer	CHNS
XRD	GCMS	ICPMS
Mercury Analyzer	SEM	AAS
TOC	FTIR	Fluorescence Spectrometer
GCMS TQ	ICPOES	UPLC

International Collaborations



Center of Excellence and Specialized Research Centers

International

Stockholm Convention Regional Centre on Persistent Organic Pollutants for Asia Region

WHO Coronavirus Network (CoViNet) Reference Laboratory

WHO Collaborating Centre for Water & Sanitation

National

DST CoE on Climate Change

DST CoE on Carbon Capture, Utilization and Storage (CCUS)

Centre for Godavari River Basin Management Studies in the States of Maharashtra and Telangana

Raw Materials purity, Compositional analysis and Emissions (RACE)

Sophisticated Environmental Analytical Facility (SEAF)

Pesticide Residual Laboratory

Critically Zone Observatory (CZO)

Technology Park

Indian Association for Environmental Management (IAEM)

Advancing Knowledge: Institutional Research Footprint (Last 5 Years)

Projects Database

A) **Total Project - 400 +**
- » Applied R&D/Consultancy-318
- » Grand-in-Aid - 60
- » Technical Services - 32

MoUs

A) **Total MoUs: 375**
- » Private - 332
- » Govt. - 10
- » NGO - 1
- » Academic-32

Research Paper

A) **Total Papers Published - 850 +**
B) **Total CIF - 4450 +**

Capacity Building Initiatives/ training programs

A) **Total Programmes - 87**
B) **Total Participants - 5969**

Patents

A) **India - Applied - 31 Nos. / Grant - 15 Nos.**
B) **Abroad- Applied - 10 Nos. / Grant - 01 No**

JIGYASA (Student-Scientist Connect Programmes)

A) **Beneficiaries**
- » 2,32,000 students
- » 8,960 teachers
- » 960 schools

Technology Know-how

A) **Tech Know-how/ Intervention Developed and demonstrated- 50+ (Total)**

Ph.D. (AcSIR and Others)

A) **New Enrollments - 87**
B) **Ph.D. Awarded - 61**

Technology Know-how and S&T Intervention

Air Pollution Monitoring and Control

- **Green Crackers -**
  Reduced Emissions Firecrackers named – SWAS, SAFAL and STAR have been commericalised and widely available acriss the country.

- **Green Crematoria** –
  Air pollution control system for open pyre crematoria successfully demonstrated in Delhi and Maharashtra

- **NEERDHUR (Domestic Multi-Fuel Improved Cookstove)** –
  Certified by MNRE, GoI for improved performance and benefiting 30000+ households.

- **PAVAK (Low-cost Improved Cookstove)** –
  5000+ units installed in Madhya Pradesh and Maharashtra.

- **NEERI-KSHAN-AQ** – UAV-based vertical air pollution profiling system.

- **Passive Air Rejuvenating System (PARS)** – Tested and effective in air pollution control.

Waste Management & Circular Economy

- **Arsenic Waste Immobilization** –
  Implemented at Goa, successfully disposing of 500 m^3 arsenic-bearing waste.

- **Eco-Rejuvenation Technology** -
  Restores degraded or contaminated lands using bamboo biodiversity, implemented in over 250 hectares of fly ash disposal sites

- **Mercury Remediation at Kodaikanal** – Full-scale remediation completed in Jan 2025, post-monitoring ongoing.

- **Dung, Fat & Oil Separation & Briquette Recovery System** – Implemented in slaughterhouse industries.

- **UV-C based Solar Photocatalytic Plant(SPP)** –Advanced secondary sewage treatment (48.000L/day) focusing on emerging contaminants

- **Laboratory Waste Liquid (LWL) Management** –Ensuring safe and sustainable heavy metal Waste from laboratories.

Water & Wastewater Treatment

- **Electrolytic Defluoridation (EDF)** – 200+ plants installed
- **High Rate Transpiration System (HRTS)** – Installed at multiple industries
- **Iron Removal (IR) Plant** – 900+ units installed
- **NEERI-ZAR (Portable Instant Water Filter)** – 1000+ units in flood affected areas
- **Himalayan Sewage Treatment Plant (Him-STP)** – Installed at field scale
- **Scientific Wetland with Active Biodegradation (SWAB)** – Hybrid wastewater treatment system
- **SWADIS-CPC** – Solar-powered water disinfection, implemented in rural areas.
- **Chemo-Defluoridation** – Household fluoride removal technology.
- **Chemo-Dearsenification** – Compact arsenic removal unit for drinking water.
- **Engineered Natural Sewage Treatment System (ENSeTS)** – Implemented at multiple sites, including Nagpur and Pune
- **Improved Moving Bed Biofilm Reactor (MBBR)** – Installed at MIDC Butibori, Nagpur (50 m^3/day).
- **Two-Stage Bio-oxidation (TSB)** – Full-scale plant (600 m^3/day) implemented at industry level.
- **Multifunctional Reactor (MFR) Technology** –Efficient waste water treatment technology for sustainable irrigation (50,000 L/day)
- **NEERIKSHAN-WQ** –Revolutionizing water sampling with sensor driven and drone based Automation
- **Submerged Aerobic Fixed Film (SAAF)** –Biofilm based sustainable waste water treatment technology
- **Novel Solids-liquid separation for dissolved Air Flotation (DAF)Slurry Management** –Sustainable and Energy Efficient Slurry Management with enhanced solid-liquid separation.
- **RISK-PiNET Software** - modular water supply network assessment software to assess pipe conditions, contamination risks, replacement costs etc.

Sustainable Sanitation & Hygiene

- **GreenDispo (Electric Sanitary Pad Incinerator)** – 500+ units installed across India.
- **DToi-FUrST (Dry Toilet System)** – Installed at 5 locations in Lahaul & Spiti.
- **NEERFLUSH** – Successfully deployed in public sanitation facilities.

Contribution to National Mission and Flagship Programmes

Namami Gange

- Special properties of river Ganga
- Monitoring of river water quality
- River rejuvenation through natural treatment systems

Swachh Bharat

- Electrolytic defluoridation
- Iron removal plants
- Natural water treatment technologies
- Rapid composting
- Menstrual waste management technologies

Swasth Bharat

- Sewage treatment systems
- Air pollution control and health benefits
- Solar water disinfection
- Electrolytic & Chemo Defluoridation
- Iron removal plants
- Improved multi-fuel cookstove
- Green Crematoria & Green Crackers

Smart Cities

- Water safety plans
- Lake restorations
- Wastewater recycle reuse
- Plantation for degraded lands

National Green Highway Mission

- Strategically designed green belt development
- Monitoring and surveillance

National Accreditations

QCI-NABL accreditation for environmental testing (ISO/IEC 17025:2017)

QCI-NABET accreditation for EIA Studies

Major Recognitions

Wastewater Epidemiology-Virus Surveillance selected for Golden Peacock Eco-Innovation Award for the year 2022 by the Institute of Directors (IOD) (Aug 2022)

CSIR Technology Award 2021 for developing Green firecrackers

CSIR Technology Award 2020 (Certificate of Merit) for Restoration of Nallahs with Ecological Units (RENEU)

Handpump Assisted Iron Removal Technology selected for DST—Lockheed Martin India Innovation Growth Program 2013

Project Innovation Award (PIA) for NEERI-Zar water purification device from the International Water Association (IWA), UK. 2011

Burhani Foundation Award - Awarded for Innovation in Environmentally Sound Technology for development of Oilzapper 2002

Technical Excellence Award conferred on by the South Indian Sugar Mills Association, Tamil Nadu.

Federation of Indian Chambers of Commerce & Industry Award for outstanding achievement in Environment Preservation and Pollution Control (1990)

National Award for Excellence in Consultancy Services by the Consultancy Development Centre.

Environmental Leadership Award by the United States – Asia Environmental Partnership.

The Ministry of Urban Development and Poverty Alleviation, Government of India felicitated NEERI, Nagpur in recognition of bioremediation of mine spoil dumps by Integrated Biotechnological Approach and design and implementation of Common Effluent Treatment Plants. (Included in the UN – HABITAT 2002 Best Practices Global 100 List).

New Frontiers and Flagship Initiatives

1 CSIR-NEERI Living Lab

Vision: Build a sustainable model campus by integrating multidisciplinary nature inspired approach for sensing, designing, validating and addressing complex concerns of sustainability & resilience

Key Objectives: Advance campus sustainability with impact monitoring, eco-friendly solutions, interdisciplinary collaboration, and measurable outcomes, extended to urban context.

Panch Bhoota: Implement a nature-inspired strategy covering eco-treatment, biodiversity observatories, and tech testbeds.

Implementation: Launch at **CSIR-NEERI** Campus with a 10-year roadmap, sustainability charter, national scaling, and integrated policy support.

2 CSIR-NEERI Test Bed Facility

Purpose: A facility for experimenting, testing, validating and demonstrating new technologies, processes, or systems before field deployment.

Features: Equipped with tools to replicate real-world scenarios for comprehensive evaluation.

Benefits: Reduces risks and costs by identifying potential issues early, ensuring readiness for real-world implementation.

Impact: Accelerates innovation by providing a platform for iterative development and refinement of emerging technologies.

3 Bamboo Bio-Germplasm Conservation Garden (BANSYA VAN)

Vision: To conserve rare and threatened bamboo species while promoting biodiversity, supporting ecological research, & provides industrial and societal solutions through sustainable land use

Transformation: 2-acre area at **CSIR-NEERI** converted into **BANSYA VAN** with 89 bamboo species from across India.

Research & Innovation: Serves as a living lab for bamboo productivity, carbon sequestration, and soil erosion control.

Industrial & Societal Impact: Provides green solutions for industries and supports community-focused ecological applications.

Ecological Significance: Now a biodiversity hotspot and a hub for students, researchers, and nature lovers.

Pan India Presence

CSIR-NEERI Delhi Zonal Centre

CSIR R&D Centre (1st floor)
A-93/94, Phase-1 Naraina
Industrial Area
New Delhi-110 028
Tel: +91-11-45609107
Fax: +91-11-45609106

CSIR-NEERI Mumbai Zonal Centre

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Fax: 22-34962882
22-24936635
22-24926859

CSIR-NEERI Kolkata Zonal Centre

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