

THE BEST WAY TO PREDICT THE FUTURE IS TO CREATE IT

We are on the brink of 'missing a closing moment' in history to limit global warming to 1.5 degrees centigrade above pre-industrial levels. If the world fails to act, temperatures are likely to rise to 3.2 degrees centigrade by the end of this century, leading to devastating impacts.

How does India meet the challenge of transitioning to a low-carbon economy and provide clean energy, food security, jobs and a better quality of life to its 1.4 billion population? How does it ensure that this transition is economically viable and socially inclusive?

These questions are at the heart of TERI's research, while working across policy, technology development, consultancy and implementation projects. Nearing five decades of our journey since we started in 1974, TERI remains committed and ambitious to help India and the Global South create a sustainable, healthy and equitable future for all.



MISSION

Our mission is to serve as innovators and agents of change to enable policies and practices for an equitable and sustainable future through conservation and efficient use of energy and other resources.

KEY GOALS


- Enhance access to clean energy for all
- Help a just transitions to renewable energy pathways
- Enhance energy efficiency in industries, public utilities, and buildings
- Facilitate more efficient use of materials, especially iron, steel, and cement
- Enable sustainable food production and nutritional security through nanobiotechnology, quality planting material, and crop diversification
- Enhance ecosystem services, especially in forestry and biodiversity
- Enhance conservation, utilization of and access to water, including watershed management
- Develop innovative solutions for clean air, regionally and in cities
- Enable planning and governance of environmentally sustainable cities through green buildings and management of solid waste, sewage and wastewater, sanitation, mobility, and air quality
- Build resilience to adverse impacts of climate change due to cyclones and variations in hydrology and temperature
- Accelerate pollution abatement through innovative policies and environment treatment products
- Develop technologies for generation of advanced biofuels and value added bio-commodities

CORE STRATEGIES

Policy advisory: including interdisciplinary and integrated policy research and analysis, financing and business model development, advisory, outreach, and capacity building among policymakers, academicians, and youth

Technology products: including technology development, demonstration through pilots, replication and scaling up, large-scale production, commercialization as well as capacity building among manufacturers, operators, and users

Technical services: including consultancy creating standard operating procedures, testing and verification, strategy development for corporates, and capacity building of stakeholders



A newly constructed water conservation pond in Unchagaon village in Patiala by TERI with the help of community engagement



TERI's manufacturing facility in Gurugram, Haryana for mass-scale production of Oilzapper

KEY PROGRAMMES

The **Energy Programme** seeks to create successful and sustainable initiatives and business models that promote clean energy technologies.

Key focus

- Enable just transitions to clean energy sources through the Energy Transitions Commission
- Promote energy efficiency in various energy intensive sectors, particularly the industrial sector
- Transform energy supply in the country by facilitating increased supply of renewable energy

The **Environmental and Industrial Biotechnology Programme** aims to develop and implement bio-based technologies to address environment and energy-related issues.

Key technologies

- Oilzapper to eliminate oil spills and manage oily sludge
- Remediation and restoration of pesticide contaminated soil by using microbial bioremediation technology
- Microbial enhanced oil recovery

- Prevention of paraffin deposition in oil well tubing
- Clean coal technology such as enhanced coalbed methanation under sub surface

The **Integrated Policy Analysis Programme**

seeks to inform policymakers about pathways which decouple economic development from environmental degradation, while enhancing livelihood opportunities and quality of life.

Key focus

- Develop modeling of economy–energy–environment linkages and alternative development pathways
- Create scenario building on demand and availability of resources
- Promote sustainable production including resource efficiency, waste management, and circular economy, and linkages with socio-economic issues
- Promote sustainable consumption, with focus on lifestyles, consumption patterns, and waste generation
- Promote resource and environmental governance and its political economy at local, national, and global levels

The **Social Transformation Programme** seeks to work with communities nationally and globally to enable clean energy solutions that enhance basic services and in a socially inclusive manner.

Key focus

- Accelerate energy access through research and implementation of lighting projects
- Promote renewable energy for livelihoods through technology and business model innovations for solar looms, cold storage, and solar micro-irrigation
- Promote mainstream gender and social inclusion in energy programmes
- Facilitate rural energy access, community development, and watershed management through monitoring and evaluation, learning, knowledge sharing, and leading the discourse

The **Sustainable Habitat Programme** aims to be a Centre of Excellence, providing technical assistance to national and subnational nodal ministries and departments for embedding sustainability in habitats, cities, and transport.

Key focus

- Develop resource efficiency and waste management in buildings and cities
- Create net-zero energy, zero-waste water discharge, net zero-waste campuses
- Promote urban transport, e-mobility, freight and logistics

The **Advanced Biofuels Programme** seeks to advance economically viable and commercial scale renewable alternatives to conventional petroleum-based fuels.

Key technologies

- Clean technology for green hydrogen production using microbe as cell factory
- Marine algal production to use as renewable feed for production of clean fuels and value added biocommodities (animal feed and aqua feed)
- Microbial intervention for clean biofuel (bioethanol, biomethane, biobutanol) production from next-generation feed
- Indigenous processes for making biodiesel production more sustainable and water efficient
- High value biochemical production with potential applications in plastics, fuel additives, textiles, polymers, and synthetic rubbers
- Continuous fast pyrolysis technology for refinery graded bio-oil, biochar and activated carbon from biomass and plastic waste

A leading technology developer, the **Sustainable Agriculture Programme** focuses on next-generation innovations in agriculture and nano-biotechnology.

Key focus

- Promote precision, climate-resilient agriculture to substantially improve crop yields
- Substitute chemical fertilizers and pesticides with bio-based alternatives
- Bioremediate industrial wastelands
- Develop green technology-based smart materials from untapped natural/waste resources
- Develop future food ingredients, nutraceuticals and therapeutics from bio-resources
- Improve livelihood of micro-farming communities through access to quality planting material and watershed management techniques



*100,000 L Capacity Marine Algal
Production, Navi Mumbai*

The **Natural Resources and Climate Change Programme** creates solutions that seek to lessen the impact on our climate, air quality, water, land, and forest through ecological processes and relevant technology and policy initiatives. The **key focus areas** of the programme are as follows:

Air

Create a high-resolution database of air pollutant emissions to suggest national- and regional-scale policy measures for air quality control

- Assist in the creation of sectoral emission management programmes
- Capacity building of pollution control boards and other stakeholders in India

Water

- Facilitate provision of safe water and improvement in water-use efficiency in industrial, domestic, and irrigation sectors
- Promote rainwater harvesting and groundwater recharge at household and watershed levels
- Provide safe and clean drinking water and efficient irrigation through sustainable technologies

Forestry and Biodiversity

- Enhance income of forest communities through sustainable harvest and marketing of minor forest produce
- Develop innovative mechanisms for generating financial resources for sustainable forest management and biodiversity conservation
- Provide coastal resource management and livelihood opportunities to local communities

Waste

- Facilitate maximization of socially acceptable resource recovery and recycling

- Increase adoption of resource-efficient manufacturing and adoption of cleaner production practices to promote circular economy
- Work with industry and industry associations to ensure safe disposal of industrial wastes

Climate

- Develop a better understanding of climate variability at different spatial and temporal scales to effectively link climate science to policy research
- Assess impacts and vulnerability on key sectors such as water, agriculture, and health
- Facilitate adaptation through identification, prioritization, monitoring, and evaluation of interventions
- Provide policy analysis for global climate negotiations on mitigation, adaptation, technology, finance, and transparency

Nutritional security

- Implement innovative approaches by tapping the potential of locally available resources to combat malnutrition
- Generate livelihood for women and youth, focusing on small-scale food processing, horticulture, and animal husbandry

Environment and Health

- Reduce the impact of air pollution, climate change, and agricultural productivity on human health
- GIS-enabled monitoring for disease surveillance and drought-resistant crops

Air quality monitoring station at India Habitat Centre in Delhi





School students participating in an environment education programme conducted by TERI

Through **Communication, Outreach and Advocacy Unit**, TERI channelizes its research to influence diverse stakeholders, including governments, media, youth, and civil society.

Key focus

- Organize national and global events such as the annual World Sustainable Development Summit
- Promote environment education and awareness amongst the youth
- Publish children's books, popular books and magazines, and peer-reviewed journals
- Raise public awareness through all forms of traditional, social, and new media

TERI **School of Advanced Studies** is a globally recognized deemed university in the sphere of sustainability studies.

Key focus

- Create new knowledge through research and contribute to the discourse on sustainability issues at national and global levels
- Design and deliver academic programmes, training and research on sustainability issues relevant to all streams of life and across age groups, assimilating the latest science and evidence

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ENERGY



AGRICULTURE



ENVIRONMENT



HABITAT



RESOURCE
SECURITY



CLIMATE



HEALTH
& NUTRITION