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BCSD India

# CORPORATE ACTION PLAN ON CLIMATE CHANGE

## White Paper

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# Message from Chairmen, TERI-BCSD India

Climate change will become increasingly central to the policy preoccupations of governments. In India, the NAPCC (the National Action Plan on Climate Change) with its eight missions provides a framework for addressing climate change as a core development issue. To participate in the eight missions, the corporate sector will have to move beyond treating climate change as a corporate social responsibility issue and treat it as a key environmental condition shaping corporate strategy.

TERI-BCSD India's initiative with its member companies to generate awareness and build consensus on the climate change agenda in India has helped companies to take the initiative in defining the new opportunities provided by NAPCC.

We appreciate the contribution of Mr Shyam Saran, Special Envoy of the Prime Minister on Climate Change, towards the success of this initiative. He has been a constant source of guidance throughout the project starting from the launch of the initiative on 29 September 2008 in Mumbai. Mr Saran also chaired our consultation with the nodal ministries, which helped us immensely in consolidating the government inputs.

We hope that the TERI-BCSD India Corporate White Paper on Climate Change will help uncover some key aspects regarding the business role in implementing NAPCC. This white paper attempts to articulate a vision for the corporate sector under each national mission and presents the expectations of the corporate sector from the government in terms of enabling policies and incentives that would help in achieving the roadmap for the industry.

We present this popular version of the Corporate White Paper in a simplified and condensed format to stimulate forward thinking and ongoing dialogue between business and government.

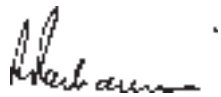
Mr Nitin Desai
Chair

Dr J J Irani
Co-Chair

# Foreword

The Prime Minister of India released the country's NAPCC (National Action Plan on Climate Change) on 30 June 2008. This plan essentially pursues the objectives of sustainable development that would increasingly guide India's development policy in the future. The plan also responds effectively to the growing evidence of global climate change, particularly as brought out in the Fourth Assessment Report of the IPCC (Intergovernmental Panel on Climate Change). However, the implementation of the NAPCC would depend on the ability of the Indian society, quite apart from governments at every level, to translate the aims and plans contained in this document into effective action at the grass-roots level. The corporate sector has to be an important part of any initiative to implement the NAPCC in all its dimensions.

TERI-BCSD India is a grouping of motivated corporate organizations, observing and supporting the aim of sustainable development for this country's economy. India is vulnerable to serious impacts of climate change, which would not leave corporate organizations untouched. Hence, in the first place, corporate organizations have to effectively evaluate the climate change impacts of direct concern to them, and also put in place effective measures and policies by which adaptation to these impacts can be brought about. Additionally, since mitigation of GHGs (greenhouse gases) would be required across the globe, and would open up new market opportunities, this is also an area that the corporate sector needs to address effectively. This document, which has been drawn up by corporate members of TERI-BCSD India, facilitated by TERI staff, is a remarkable effort to put the stamp of corporate intentions and plans on India's NAPCC. This corporate effort also spells out actions that the government may need to take to ensure effectiveness of efforts by business. It, therefore, marks a remarkable initiative by business and industry to address national imperatives and priorities.



Dr R K Pachauri
President – TERI BCSD India
and Director-General, TERI



# Message from Task Force Leaders

The NAPCC (National Action Plan on Climate Change), released by the Prime Minister's Advisory Council on Climate Change on 30 June 2008, serves as the first country-wide framework on climate change with the approval and support of the GoI (Government of India). The eight missions in the NAPCC map out long-term and integrated strategies to achieve key national goals from the climate change perspective. The NAPCC identifies measures that promote development objectives of the country while producing co-benefits that address climate change effectively.

The Corporate White Paper attempts to complement the ministerial efforts in developing plans of action under each national mission. Through this initiative, we have identified several paths forward for our industry to reduce its ecological footprint, manage its impact better, become more eco-efficient, and thereby play a significant role in the implementation of the NAPCC.

We are proud of this Corporate White Paper, which brings out a vision for the corporate sector under each national mission and presents the expectations of the corporate sector from the government in terms of enabling policies and incentives that would help in achieving the roadmap for the industry.

We have used a consultative multi-case approach for developing the Corporate White Paper. To facilitate focused discussions, four Task Forces were constituted with the TERI-BCSD India member companies. Through successive consultations, including an interactive session with HE Mr Ban Ki-moon, United Nations Secretary General, these Task Forces have undertaken review of all the eight missions to determine opportunities and implications for their businesses. Representatives from all relevant sectors namely steel, chemicals, paper and pulp, metals and minerals, oil and gas, cement, power, pharmaceuticals, ICT, and finance, participated as part of the Task Forces in the consultations held in Mumbai and New Delhi on 29 September 2008 and 17 December 2008, respectively.

TERI-BCSD India also organized an Inter-Ministry Meeting on the NAPCC Corporate White Paper on 8 January 2009 in New Delhi. This was the first time that eight select ministries came together to note the draft findings of the initiative. The forum also facilitated a discussion with senior government representatives and TERI-BCSD India member companies on the industry's role in NAPCC.

We thank all colleagues and collaborators for the hard work put into developing the Corporate White Paper presented here as the Corporate Action Plan on Climate Change.

Mr Sumit Banerjee
ACC Ltd

Mr Prasad Chandran
BASF India Ltd

Mr Arun Seth
BT (India) Pvt. Ltd

Ms Naina Lal Kidwai
HSBC India

Mr Sajjan Jindal
JSW Steel

Mr Homi Khusrokhan
TATA Chemicals Ltd

# The Path Ahead

The member companies of TERI-BCSD India have taken the initiative in defining the new opportunities provided by the NAPCC (National Action Plan on Climate Change) released by the Prime Minister on 30 June 2008.

In this regard, the members through their active participation have brought out the White Paper on Corporate Action Plan on Climate Change. The focus is to successfully convert the white paper into activities and programmes which would herald India Inc.'s commitment to address climate change.

TERI-BCSD India is now embarking on a global outreach with the support of its member companies. The popular edition of the White Paper will be extensively distributed and tabled in several climate change fora in India and overseas beginning with the World CEO Forum on 4 February 2009 in New Delhi—right through to the COP 15 in Copenhagen, Denmark in December 2009.

We are delighted to acknowledge our immediate partners in this initiative who have reaffirmed their commitment to work with TERI-BCSD India on this global outreach.

## Corporate Action Plan Champions

**GMR Group - Delhi International Airport (P) Ltd**

**HSBC India**

**Intel Technology India Pvt. Ltd**

**Oil and Natural Gas Corporation Ltd**

## Corporate Action Plan Subscribers

**ACC Ltd ▪ BASF India Ltd ▪ Det Norske Veritas As ▪ JSW Steel Ltd ▪ Shell India Pvt Ltd Suzlon Energy Ltd ▪ Tata Chemicals Ltd**

Special Acknowledgement

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For more information, please contact: bcsd@teri.res.in



# List of abbreviations

| | |
|---|---|
| BEE | Bureau of Energy Efficiency |
| CDM | Clean Development Mechanism |
| CNG | Compressed natural gas |
| $CO_2$ | Carbon dioxide |
| DST | Department of Science and Technology, Government of India |
| ECBC | Energy Conservation Building Code |
| EETs | Energy-efficient technologies |
| GDP | Gross domestic product |
| ICT | Information and communication technology |
| IT | Information technology |
| IPCC | Intergovernmental Panel on Climate Change |
| IPR | Intellectual Property Right |
| IRR | Internal Rate of Return |
| JFMC | Joint forest management committees |
| JNNURM | Jawaharlal Nehru National Urban Renewal Mission |
| LED | Light-emitting diodes |
| MIS | Management Information System |
| MNRE | Ministry of New and Renewable Energy, Government of India |
| MSME | Micro, small, and medium enterprises |
| MT | Metric tonnes |
| MW | Megawatt |
| NWP | National Water Policy |
| PPP | Public–private partnership |
| PV | Photovoltaic |
| R&D | Research and development |
| SBB | State Biodiversity Board |
| RPS | Renewable Portfolio Standard |
| SMEs | Small and medium enterprises |
| TERI | The Energy and Resources Institute |
| TOF | Trees outside forests |
| VAT | Value-added tax |

# National Solar Mission

India faces unique challenges in developing adequate energy supply to meet the country's developmental needs, which also includes providing electricity to the 44% of its population without grid access.

The mission endeavours to have a substantial increase in solar energy in the total energy mix.

This will promote development and use of solar energy for power generation and other uses—that is, make solar competitive with fossil-based energy options, besides developing other alternatives to conventional sources of fuel.

## Challenges

- High capital costs
- Large-scale storage system to meet base load power and improve dispatchability
- Lack of supply and service network
- Lack of customized products

## Government support

- A long-term policy for generation-based incentives without cap on capacity of individual installations or in the aggregate along with long-term funds to begin the execution of activities.
- PPP (public–private partnership) project approach for solar thermal projects will accelerate the process to reach the goals.
- Policy/regulatory support in IPR (Intellectual Property Rights) and technology transfers for solar thermal power technologies—this includes cost benchmarks and compulsory licensing.
- Tax benefits for projects developed and executed by solar power project developers (third party developers).
- Long-term R&D (research and development) funds to improve R&D and testing of solar power technologies.
  - Private/public research organizations
  - Industry participation in Solar Energy Centre
  - Develop exclusive Solar Test Platform for high-end technologies (similar to Almeria solar platform).
- Integration of different schemes and introduction of REC (Renewable Energy Certificates) tradable certificate scheme for solar electricity.
- Special incentives for industrial steam generation technologies.
- Solar maps/data for beam radiations for potential states.
- Solar electricity specific portfolio standards in RPS to promote solar energy
- Capacity-building at all levels.

## Way forward

- *Challenge fund* A PPP model to install 1000 MW of PV (photovoltaic) capacity by 2012, encourage R&D, and reduce cost of new technologies for the solar thermal sector in India. The World Bank's Technology Transfer Fund may be put to use where the corporate sector can play a role in adopting new technologies.
- Solar thermal based power plant of more than 50 MW, as the IRR (Internal Rate of Return) is attractive for this size—thus developing new technologies, one of the core components of this mission.
- R&D for components and systems such as LED lighting, solar drying of food processing industry, and solar steam generation systems for industrial applications
- Create demand for solar applications through rapid scaling up of capacity and determining the ways of scaling up, thereby promoting opportunity for reducing cost and increasing efficiency.
  - The first phase of implementation promotes solar thermal demonstration models; the government can facilitate bidding to set up these models.
  - The second phase involves scaling up these models.

"For every solar lantern implementation there is potential carbon credit available but this requires aggregation at the retail level in order to avail of the facility. There is also a need to look at appropriate technology interventions, such as biomass based energy, for the rural poor in such a manner that the end-beneficiary cost is affordable through commercial manufacturing, government incentives and bank finance."

**Ms Naina Lal Kidwai, Group General Manager and Country Head, HSBC India**



# National Mission for Enhanced Energy Efficiency

The NMEEE (National Mission on Enhanced Energy Efficiency) focuses on (i) developing a market-based mechanism to enhance cost-effectiveness of improvements in energy efficiency in energy-intensive large industries through certification of energy savings that could be traded (PAT [perform, achieve, and trade] mechanism), (ii) accelerating the shift to energy-efficient appliances, (iii) promoting ESCOs (energy service companies) , and (iv) providing fiscal incentives to promote energy efficiency.

The corporate sector is an integral part of this mission as the industrial sector is the largest consumer of energy, accounting for nearly 50% of the commercial energy consumption in the country. Hence, concerted efforts are required by the corporate sector to adopt energy-efficient technologies and practices and thereby reduce their overall energy intensity. Other co-benefits include reduction in fuel and material use, reduced local emissions, and improved product quality.

Mechanisms like PAT and ESCOs under NMEEE also provide numerous opportunities to the private sector to enhance their activities in the energy conservation field (for example, activities like verification, monitoring, and validation). The Energy Conservation Act 2001 provides the legal mandate for the implementation of the energy efficiency measures through the institutional framework of the BEE (Bureau of Energy Efficiency).

## Challenges

- Encouraging the corporate sector to invest in capital-intensive energy-efficient technologies.
- Strengthening the R&D infrastructure for developing energy-efficient technologies and products.
- Developing/strengthening institutional support framework for providing technical support in MSMEs (micro, small, and medium enterprises).
- Creating a demand for ESCO-related services.
- Increasing market penetration of energy-efficient products and appliances.
- Addressing the variations within each industry sub-sector while developing PAT mechanism.

> "We should also look at the full life cycle carbon footprint of a product rather than only post manufacturing energy mitigation potential."
>
> **Mr Sumit Banerjee, Managing Director, ACC Ltd**

- Enhancing knowledge sharing amongst different stakeholders such as manufacturers/technology suppliers, financial institutions, intermediaries, and end-users.

## Government support

Many of the large Indian companies have demonstrated their commitment towards reducing their energy consumption by adopting energy-efficient technologies and practices in their plants.However, it is felt that an enabling policy environment covering various regulatory, financing, and market development mechanisms would greatly help in accelerating the adoption of energy efficiency measures in the industrial sector. The TERI-BCSD members have expressed the need for developing/strengthening provisions under the following heads.

- Creating an 'Energy Efficiency/Clean Technology Fund' and providing financial incentives for adoption of energy-efficient technologies.
- PPP (public–private partnership) for establishing 'Centres of Innovation' to enhance R&D efforts in energye.
- Creating conducive market conditions for energy-efficient products/appliances through Energy Labelling and Public Procurement Programmes.
- Developing sector- /cluster-specific programmes and strengthening the existing institutional structures in the MSME sector for development, demonstration, and dissemination of cleaner technologies.
- Encouraging promotion of ESCOs.
- Creating a National Platform for Knowledge Sharing amongst key stakeholders.

## Way forward

The corporate sector recognizes energy efficiency improvements as an important option for achieving cost-effective $CO_2$ (carbon dioxide) abatement in the industry sector. Some of the actions that can be undertaken by the corporate sector are given below.

- Demonstrate the top management's commitment through internal communications and actions like (1) developing 'Energy Management Policy statement', (2) demarcating Energy Efficiency Funds at the corporate level, (3) strengthening 'Energy Management Cells' at the plant level, and (4) encouraging participation in energy management programmes at shop-floor level through acknowledgement and incentivization.
- Accelerate efforts to identify and implement energy-efficient technologies and practices at individual plant level. These include (1) sector-specific technology options, (2) cross-cutting technologies, (3) fuel switch, and (4) recycling and increased use of secondary material.
- Enhance the use of ICT (information and communication technology) as a cross-cutting option for process optimization, monitoring and verification, and energy efficiency improvements.
- Proactively work with BEE and develop industry-specific 'Energy Benchmarking Norms' for various industry sectors/sub-sectors.



# National Mission on 'Sustainable Habitat'

Population and economic growth along with structural shifts in the Indian economy have exponentially increased the pressures on delivery of basic services for all—for the government as well as the private sector. Civil society needs three basics: transport, energy efficiency in residential and commercial areas, and solid waste management. The government alone cannot deliver, and it is for the private sector to come up with rapid solutions.

## Promoting Energy Efficiency in the Residential and Commercial Sector

In an attempt to promote energy in the residential and commercial sectors, the NAPCC (National Action Plan on Climate Change) emphasizes on (i) the extension of the ECBC (Energy Conservation Building Code), (ii) use of energy-efficient appliances, and (iii) creation of mechanisms that would help finance demand-side management.

In a study conducted by TERI, it was found that implementation of energy efficiency measures would contribute to 30% energy savings in new residential buildings, and 40% savings in new commercial buildings. Further, in the case of existing buildings, the energy-saving potential for residential buildings is estimated to be about 20% and that for commercial buildings to be about 30%.

Despite these positive trends towards achieving sustainable habitats and energy efficiency, there are key barriers to widespread commercialization and implementation of passive design strategies, efficient lighting and space conditioning measures, use of renewable sources of energy, and use of energy-efficient appliances in new residential and commercial buildings.

"We should be really looking at all these new technologies in terms of how do we make both of our own houses, the houses of our employees and the building of corporate where we are living which are far more sustainable to energy efficiency."

**Mr Arun Seth, Chairman, BT (India) Pvt. Ltd**

The corporate sector can contribute, and has indicated support, to numerous initiatives undertaken in response to the priorities implicit in the NAPCC. This section identifies the potential areas that would benefit with support from the corporate sector towards sustainable habitats.

### *Challenges*

- *Knowledge gap at various levels* (amongst builders, designers, architects, politicians, investors, and consumers). The construction industry remains unaware of the environmental impacts of its operations—and the economic, environmental, and health benefits of using green and efficient products and appliances. There is lack of sustainable building solutions as well. This needs knowledge promotion among architects, system providers, and other professionals.
- *Enforcement and implementation of strategies* to encourage adoption of energy-efficient buildings, products, and services are required. Lack of programmes for monitoring and verification, policy mandates, and incentives (both financial and symbolic) need to be addressed to encourage greater participation from the corporate sector.
- *Lack of technological R&D activities for lowering the costs* acts as a barrier to widespread use of energy-efficient products and services. Investments to arrive at innovative low-cost technology options for developing sustainable habitats are required.

### *Government support*

- Providing a national platform to project individual efforts, and exhibit financial benefits of 'green' buildings.
- Public awareness drives to encourage developers to go for 'green' rating, particularly GRIHA.
- Sectoral benchmarking for the industry.
- Bridge knowledge gap at various levels.
- Incentives for builders to encourage developers to go beyond the stipulated laws and bylaws.

### *Way forward*

- Conduct training programmes, workshops, and conferences; develop websites; and construct demonstration buildings towards bridging the knowledge gap.
- Encourage corporate/company policy to adopt 'green' rating[1] of buildings, that is, encourage energy efficiency in buildings.
- Provide recognition and awards to encourage enforcement and implementation of sustainable building design and construction practices.
- Contribute to technology development and lowering the costs of 'green' products by encouraging competitive markets.
- Provide investment in R&D needs for the residential and commercial sectors.
- Financial institutions may work out innovative financing packages for energy-efficient buildings/ retrofits.
- Private ESCOs (energy service companies) may play a key role in guaranteeing energy savings, or providing services at a lower cost, by taking responsibility for energy efficiency investments, and improvements in maintenance and operation of facilities through arrangements like energy performance contracting.
- Encourage use of LEDs and 'green'-labelled equipments at the workplace and residence of employees. Encourage retrofitting and use of solar panels in all buildings.

## Management of Municipal Solid Waste

In the absence of an efficient MSW (municipal solid waste) management system, solid waste is dumped indiscriminately into low-lying areas designated as solid waste landfills with little or no treatment. There is no containment system in these disposal sites and this leads to groundwater contamination. Also, the uncontrolled emission of methane, which was estimated at about 7 MT (million tonnes) for the year 2007, is likely to go up to 39 MT for year 2047 if no efforts are undertaken for systematic disposal of MSW. The unsanitary conditions prevailing at these disposal sites pose a health hazard to sanitary workers and ragpickers frequenting the sites.

The focus of NAPCC with respect to improving MSW management in the country includes maximizing resource recovery and recycling and minimizing waste disposal at already fast-filling landfills. It also emphasizes the need to maximize recycling/reuse of sewage generated in various cities, which is a source of pollution in most of the water bodies in the country.

### *Challenges*

- Segregated collection of waste with the help of informal sector.
- Upgrading/improving recycling technologies.
- Dovetailing plastic and metal waste recycling with e-waste recycling programmes.
- Maximizing reuse of treated sewage.
- Customization of waste-to-energy processes to waste quality in India.
- Developing sanitary landfilling facilities.

### *Government support*

- Enable conditions for the corporate sector to participate in waste management at the local administrative level.
- Regulation of management of non-hazardous waste with focus on its recycling/reuse is urgently needed.
- JNNURM (Jawaharlal Nehru National Urban Renewal Mission) mechanism to identify a role for the corporate sector in urban infrastructure improvement.
- Need for triple bottomline reporting of performance by the corporate sector—economic/social/ environmental balance sheet.
- Institutionalize awards and incentives.

### *Way forward*

- Working with municipal bodies for maximizing recycling of waste and ensuring sound urban waste management.
- Promote biochemical conversion of organic waste.
- Help organize participation of the informal sector—recycling and reuse of urban solid waste (including e-waste) and waste water.
- Special focus on development of technology for producing power from waste.

[1] Accept GRIHA (which is the national rating system for buildings and incentivized by Ministry of New and Renewable Energy) and ECBC as voluntary codes through company policy. Since GRIHA compliance also ensures compliance with national regulations and codes (such as ECBC), which have been established by various government bodies.



- Use IT—computerize MIS, data collection/ evaluation, and report generation, development of decision-support system, loading/offloading distance learning, and capacity-building modules.

## Promotion of Urban Public Transport

The increasing transport demand in India raises concerns related to energy security and increasing $CO_2$ emissions. These concerns need to be addressed in the current global situation where tackling issues related to climate change is gaining importance worldwide. Tackling climate change issues related to transport is a part of the Sustainable Habitat mission of NAPCC. NAPCC emphasizes the need to reduce the transport sector's dependence on fossil fuels. It suggests that better urban planning and modal shift to public transport are necessary to facilitate the growth of medium and small cities in an environmentally benign manner. The plan specifically lays emphasis on extensive public transport facilities and non-motorized modes in urban areas in order to discourage the use of personal vehicles. The plan suggests some technical, fiscal, and policy actions to direct transport growth towards the path of sustainability. The corporate sector can undertake numerous initiatives that can help reduce use of fossil fuels and $CO_2$ emissions from the sector in line with NAPCC focus areas.

### *Challenges*

- Lack of incentives for environment-friendly vehicle technology and fuels.
- There is no integrated policy or programme that targets inter-modal shift to sustainable modes.
- There are weak fuel efficiency standards for the auto sector; fuel quality roadmap and emission norms after 2010 are not laid down till now.
- Inadequate transport infrastructure.

### *Government support*

- Incentives for manufacture and purchase of environment-friendly vehicle technology.
- Roadmap for fuel quality and emission norms after 2010.
- Fuel efficiency standards.
- Encourage PPP to create sustainable transport infrastructure.
- Involve private sector in the provision of public transport in cities.
- Integrated policy/programme targeting inter-modal shift by the corporate sector.
- Encourage ICT-based solutions for traffic management.

### *Way forward*

- Improvement of existing vehicle technologies and development of new environment-friendly vehicle technologies for future.
- Promotion of alternative fuels.
- Improvement and augmentation of transport infrastructure and provision of public transport in urban areas.
- ICT enabled infrastructure for traffic management.
- Inter-modal shift for freight movement.

# National Water Mission

The National Water Mission focuses on integrated water resource management that will help to (i) conserve water, (ii) minimize wastage, and (iii) ensure more equitable distribution both across and within the states. Taking into account the provisions of the National Water Policy (NWP 2002), it proposes to develop a framework to optimize water use efficiency by 20% through regulatory mechanisms with differential entitlements and pricing.

## Challenges

- Design incentive structure to promote water-neutral and/or water-positive technologies, which would ensure a multitude of co-benefits in the future.
- Focus on SMEs (small and medium enterprises), an important sector in water usage.
- Recycle waste water to meet a considerable share of urban water needs.
- Implement desalination technologies (such as low-temperature desalination) that allow use of ocean water for use in coastal cities.
- Agricultural water use—optimize efficiency of existing irrigation systems and rehabilitation of systems that have been run down.
- Better management strategies on a river basin scale.
    - Revisiting the National Water Policy so as to include this component in view of recent trends in variability in rainfall and temperature affecting the flow in rivers attributed to climate change.
    - Enhanced water storage capacity, rainwater harvesting, recharging of groundwater sources, and equitable and efficient governance.
- Assess and mitigate the regional impacts of climate change on water resources.

## Government support

- Fixing a National Definition on water-positive/ neutral concept.
- Industry-wise benchmarking and target setting for water conservation and efficiency (replicating BEE Model) where SMEs also need to be targeted.
- Setting targets (percentage) for waste water recycling and reuse.
- Regulatory guidelines for target-based water usage in the coastal region; using cost-effective and environment-friendly desalination technologies; and addressing regulation issues (central versus state).
- Implementing Groundwater Policy for the industries ensuring artificial recharge and rational withdrawal of groundwater.
- Rational Water Pricing that reflects scarcity, incorporates cost of environmental degradation, and encourages efficient use and conservation.
- Government mandated industrial water audits, rainwater harvesting, and artificial recharge, and incentivizing the industry for such measures—for example, through Water Cess Act.

## Way forward

- Improving water use efficiency and water conservation by integrating water into Core Business Planning.
- Reduce water footprints by adopting advanced technology (improving efficiency and water rating), increasing industrial water productivity, and undertaking mandatory industrial water audits and conservation measures like rainwater harvesting and artificial recharge.
- Renewed business strategies with financial outlay for water saving (Water Policy of industries)—with timelines and voluntary targets to achieve their specific steps.
- Create a bank of technologies for sharing and dissemination of BAT (best available technologies) to other industries and users.
- PPP (public–private partnership) to support adoption of water-efficient technologies among communities.
- Support research and development.

"Various programmes which government has enunciated will fall flat unless industry takes it upon themselves to realize that it is business opportunity they have to do and there are some constraints."

**J J Irani, Director, Tata Group of Companies**



# National Mission for Sustaining the Himalayan Ecosystem

The Himalayas represent a great diversity in climate, which is reflected in their hydrological, ecological, and social characteristics. With changes in climate, the delicate balance of Himalayan diversity is getting disturbed and resulting in shifting of species habitats to higher altitudes, severe fragmentation in their composition, habitat loss, and even extinction.

Societal pressures such as land-use changes, over-grazing, trampling, pollution, vegetation destabilization, and soil loss are aggravating the vulnerability due to climate change.

Time-bound measures have the potential to reverse the degradation of ecosystems while meeting increasing demands for their services. However, large-scale actions are required than those currently under way.

> "Everyone appreciates the beauty of the Himalayas but how many realize how fragile this wonderful asset is? A widespread awareness of the fragility of the Himalayas eco system is something desperately called for today and the risk that neglect on our part could cause to the livelihood of hundreds who depend on it."
>
> **Mr Homi Khusrokhan, Ex-Managing Director Tata Chemicals Ltd**

## Challenges

The sustainability of various development projects in different sectors is significantly vulnerable to climate change impacts.

- *Hydropower projects* Sustainability of hydel projects being planned with high-value investments is under threat due to 'deglaciation', changing snowfall pattern, and GLOFs (glacial lake outburst floods).
- *Industries* Herbal medicines, cosmetics, and industries (breweries, cold drinks, and mineral water) dependant entirely on water.
- *Tourism* Overall GDP (gross domestic product) of the states is affected with a fall in employment, income, and revenue loss for the individuals, the private sector (airlines, hotels, tour operators, transport services, and so on), and the state.
- *Export* Besides providing livelihood to local people, export of fruits, dry fruits, and ornamental flowers boosts India's foreign earnings, which will get affected.

### *Indirect impacts/ impacts on riparian states*

- Reduced and erratic water supply in the rivers affects the agriculture of Indo-Gangetic plains, subsequently impacting supply of raw material to the industries (like sugar and textile), with a negative fallout on the tertiary sector (trade, transport, and so on) as well.
- Loss of livelihood of the local populace hits the entire economy of the area, causing a southward slide in the trade, finance, and services (bank, telecom, and general goods producers).
- Increase in frequency of natural calamities will make the insurance sector pay larger claims.

## Government support

Consultations with the corporate sector highlighted the lacking awareness among the corporate community about the impacts of Himalayan Ecosystem degradation. They presented their willingness to share the responsibility in protecting the Himalayan Ecosystem, provided they are informed about the possible consequences by sector.

Simultaneously, they seek certain policy initiatives from the government that will assist them in playing their role better in climate change adaptation and mitigation.

- Incentives in the form of subsidies and tax holidays, to encourage corporate establishments across the Himalayan states to turn into Green Centres.
- Policy to regularize transport sector in Himalayan states, and promote 'green' vehicles, backed by sustained availability of green fuels (like CNG) in

order to provide a better platform for corporate role in eco-friendly transport.

- *'Green' tourism* Incentives to hotels for adopting eco-friendly habits like the following.
  - Installing solar lights/water heating, gas-based heating systems, and so on
  - Reducing waste as well as its 'green disposal'
- *'Green' ratings* Detailed guidelines specific for Himalayan Ecosystem for best corporate practices in different sectors.
- Outsource time-bound replanting of deforested land.
- Incentives for establishment of 'green' industries (service-based) in the area that will also generate employment for the local people.
- Incentives and regulation to promote conservationof water.

## Way forward

PPP (public–private partnership), backed by remedial government policies, offers opportunities to redress the ecosystem. Certain issues like the following need urgent attention.

- Himalayan Ecosystem Conservation Fund to carry out research work and develop eco-friendly technologies suited for the region—collected through cess or donations from the corporate sector.
- Glacier Monitoring Programme providing basic data for assessing and predicting the effect of glacial melt on water resources.
- Creating Centres of Excellence for development in a sustainable manner.
- Regional dialogue for interventions at the catchment level.



# National Mission for a Green India

Forest ecosystems are critical for environment sustainability. In the context of climate change, forest ecosystems are unique as they can act as a source or sink of $CO_2$, the most abundant GHG gas. At the same time, forest ecosystems are also impacted or likely to be impacted by climate change through changes in species composition, structure, productivity, and biodiversity.

The Green India Mission has identified two broad areas of action: (i) increase forest cover and density, and (ii) conserve biodiversity.

### *Increasing forest cover and density*

As mandated in the National Forest Policy (1988) and the National Environmental Policy (2006), the ultimate aim is to bring one-third of the geographic area of the country under forest cover through afforestation of wastelands and degraded forest areas. A key programme to facilitate this is the Greening India Programme, under which 6 million hectares of degraded forest area, that is 1.83% of India's land cover, would be afforested with the participation of JFMCs (joint forest management committees).

### *Conserving biodiversity*

The mission recognizes the need for effective conservation of biodiversity both within and outside PAs (protected areas). *In-situ* and *ex-situ* conservation, documenting genetic diversity and traditional knowledge through biodiversity registers, and effective implementation of Wildlife (Conservation) Act and National Biodiversity Conservation Act, 2002 have been identified as key provisions to conserve biodiversity.

## Challenges

- No enabling laws or policies to facilitate private sector participation in forestry activities, access to degraded forest land for raising commercial plantations, or conducting conservation activities.
- Lack of technologies in afforestation of degraded and problematic sites and poor planting material (low productivity). The corporate sector can collaborate with academic institutions and research organizations to facilitate new technologies and improve planting material.
- Integration of biodiversity concerns and challenges into their long-term strategic growth plans, such as through the development of corporate- /company-level BPS (Biodiversity Policy Statements).

"R&D is critical to the topic of climate change. Don't leave R&D only to the governmental sector. Public-private partnerships in R&D are the need of the hour."

**Mr Prasad Chandran, Chairman and Managing Director, BASF India Ltd**

## Government support

- Policy directive for a Tripartite Partnership between forest department, local community (JFMCs, biodiversity management committees), and private sector.
  - An initial policy directive from the central government, followed by resolutions and guidelines by individual state governments, to facilitate private sector participation in forestry activities.
- Tax benefits and incentives to the corporate sector raising forest corridors and plantations as a carbon bank, and taking measures to reduce dependence on raw material drawn from natural habitats.
- Facilitating tie-up and capacity-building between R&D institutions and the corporate sector, which would produce improved planting materials and technology for rehabilitation of degraded and difficult sites.
- Reviewing felling and transit regulations for the corporate sector initiating and upscaling farmer–industry tie-up.

- Incentives and regulation to promote conservation of water.

## Way forward

- Corporate participation in afforestation activities through multi-stakeholder partnership—commercial plantations in degraded forest areas and other wastelands, developing forest corridors, and so on.
- Scale up farmer–industry tie-up to promote farm forestry.
- A long-term procurement plan identifying raw material for industries (for example, pharma, herbal, wood-based industry, and so on) directly dependent on various bio-resources.
- A common platform between the corporate sector, governments, academicians, and NGOs to disseminate research findings and facilitate conservation.



# National Mission for Sustainable Agriculture

The importance of agriculture in India can be realized from the fact that the livelihood of the majority of the country's population depends on it. This sector contributes 21% to the country's GDP, and rural areas are still home to about 72% of the India's population.

However, the world of agriculture has changed dramatically over the past 30 years. Globalization, far-reaching technological and institutional innovations, and new roles for the state, private sector, and civil societies, define a new context for a changed agriculture scenario. New uses for traditional crops, for example, maize and sugarcane for biofuel, open new opportunities and risks—as do a plethora of newly integrated regional markets. Recent record high agricultural commodity prices are the result of the increased demands on the agriculture sector to produce food, fodder, and fuel. Combating the effects of climate change presents the private sector with many new opportunities, not only by reducing the fallout of climate change, but also through entrepreneurship.

Sustainable Agriculture, one of the missions identified by the NAPCC (National Action Plan on Climate Change), focuses on four areas crucial for agriculture to adapt to climate change namely dry land agriculture, risk management, access to information, and biotechnology.

## Challenges

- R&D for dry land agriculture mainly focusing on development of drought and pest-resistant crop varieties including application of biotechnology.

"Corporates should also consider productivity and processing issues of cereals. Running our Krishi Vigyan Kendras in PPP mode may lead to efficient management. Corporates could lend their engineers for developing low cost farm implements."

**Mr Sajjan Jindal, Vice Chairman & Managing Director, JSW Steel Ltd**

- Development of innovative business models along with financial support to the farmers to be able to invest and adopt technologies to overcome climate-related losses.
- Development and validation of weather derivative, which is a key requirement of the insurance industry to design weather-related insurance products.
- To disseminate required knowledge, information, and skills to the farm communities, particularly to resource-poor farmers with small land holdings.

## Government support

- Create a common platform of all stakeholders for overall development for example, agriculture implementing agencies, non-profit organizations, the private sector, and government departments.
- Policy support to agriculture extension services and promote PPP (public–private partnership) by providing incentives for innovation.
- Special packages for private sector to work on dry land farming.
- Policy support to promote storage of agriculture produce, packaging innovations, and post-harvest processing.
- Biotechnology parks should have clearly defined policies for technology enhancement and its application.

## Way forward

- Developing new business models (for example, promote call centres and ITC *e-choupal*) to provide information on specific crops for strengthening agriculture extension services and watershed development programmes.
- Support biotechnology research and development activities for development of drought and salinity resistant crop varieties.
- Design and promote innovative insurance products for farm communities.
- Design and promote business models for safe and long-term storage, and post-harvest processing (includes transportation and packaging).

# National Mission on Strategic Knowledge for Climate Change

Development and poverty eradication are the best form of adaptation to the impacts of climate change. The aim is to promote knowledge sharing and enlist the global community to collaborate in research and development of technologies that counter climate change.

The focus is on risk reduction, management, and pursuit of new business opportunities. To gain a better understanding of climate science, impacts, and challenges, this mission plan envisions improved climate modelling, and increased national and international collaboration.

Integrating data management, climate prediction, and early warning systems – and classification of such data for climate research, private sector as end-users – will synergize climate research with crop insurance and others. This would be an innovative way of protecting millions of agriculturists, mitigating the risk of extremes through an extensive collection of meteorological data and their analysis.

Knowledge sharing and enlisting the global community to collaborate in R&D of technologies will counter climate change. Development and poverty eradication are the best forms of adaptation to the effects of climate change.

> "The energy security of any corporation looking ahead for the next 30-40 years is more likely to lie in its acquisitions of command over carbon saving technology than sources of supply."
>
> **Mr Nitin Desai, Distinguished Fellow, TERI and Co-Chairman, TERI-BCSD India**

## Challenges

- Skilled manpower.
- Complete archive of weather and climate data, appropriate climate models, and supercomputing facilities to support climate research.
- Awareness requirement—setting up climate information low platforms.
- Funds—high cost of scientific equipment for weather, soil, snow, water, and biodiversity monitoring; and running complex climate models on supercomputers.
- Lack of funding on adaptation and CDM technologies.

## Government support

- Wider platform to provide tie-up between R&D institutions and the corporate sector.
- Legislative measures to integrate PPP (public–private sector partnerships) on creating climate modelling opportunities, data mining/ warehousing, and so on.

## Way forward

- Set up a climate centre with joint venture funds, encourage research and sponsored PhD programme.
- Establishment of weather and climate data and easy access of data to climate researchers and end users of climate community.
- Best technology and technical capacities on hardware/software support on data and climate modelling.
- A common platform to facilitate positive interaction between the private sector, research institutes, non-profit organizations, and the government.
- Set up a new Climate Science Research Fund.
- Corporate initiatives on climate research—develop adaptation and mitigation technologies through Venture Capital funds.



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## Participating ministries/departments

| | | |
|---|---|---|
| Prime Minister's Office | Ministry of Earth Sciences | Ministry of Power |
| Central Ground Water Board | Ministry of Environment and Forests | Ministry of Urban Development |
| Department of Science and Technology | Ministry of New and Renewable Energy | Ministry of Water Resources |

## Participating companies

| | | |
|---|---|---|
| ACC Ltd | Forbes India | ONGC Ltd |
| ABN Amro Bank | Hindustan Unilever | Rajasthan State Mines and Minerals Ltd |
| All India Plastic Industries Association | Hindustan Zinc Ltd | Rallis India Ltd |
| Areva T and D Ltd | HSBC Ltd | Reliance Industries Ltd |
| BASF India Ltd | Huntsman International India (Pvt.) Ltd | RBS Home Appliances |
| Bharat Petroleum Corporation Ltd | IDBI Bank Ltd | Senergy Global, Suzlon Group of Companies |
| Bosch Ltd | IDFC Ltd | Shell India |
| BT India Ltd | IFFCO Ltd | Shree Cement Ltd |
| Cairn India | Indian Semi-Conductor Association | Seshasayee Paper and Boards Ltd |
| Coca-Cola India Inc. | Indian Wind Energy Association | Tata BP Solar India Ltd |
| DCM Shriram Consolidated Ltd | Intel Technology India Pvt. Ltd | Tata Consultancy Services |
| Delhi International Airport (P) Ltd | Jaiprakash Associates Ltd (Cement Division) | Tata Chemicals Ltd |
| GMR Group | | |
| Det Norske Veritas AS | JSW Cement Ltd | Tata Steel Ltd |
| Dr Reddy's Laboratories | JSW Steel Ltd | Tata Power Company Ltd |
| ELCOMA | Mahindra and Mahindra Ltd | The Royal Norwegian Embassy |
| Eureka Forbes Ltd | NASSCOM | Toyota Kirloskar Motor Pvt. Ltd |
| Fertilizer Association of India | Nokia India Pvt. Ltd | Vodafone Group |
| Freeplay Energy India Pvt. Ltd | NTPC Ltd | Wipro Technologies |