



Shri Narendra Modi  
Honourable Prime Minister  
of India



# India's Progress in Combating Climate Change

## Briefing Paper for UNFCCC COP 20 Lima, PERU

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सत्यमेव जयते

Ministry of Environment, Forests and Climate Change  
Government of India





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## FOREWORD

The challenge of climate change is often referred to as the defining global issue of our time, which poses a key threat to sustainable development. Vulnerability to climate change and natural disasters has a strong linkage with poverty and has the potential to create multiple stresses over any country's growth trajectory. It is therefore imperative to ensure climate resilient development especially in developing and least developed countries where there are greater needs for adaptations, because of their higher vulnerability to the adverse impact of climate change. Adaptation and mitigation options can help address climate change, but no single option is sufficient by itself. Low carbon development strategies while considering climate change mitigation have to be understood in the larger context of sustainable development to include aspects of equity, energy security and livelihood security.

Many developing countries including India have been rapidly enhancing their own climate change actions at the domestic level, as appropriate to their national circumstances. The Government of India has taken several initiatives in terms of policies and programmes to explore and implement low carbon development strategies. Way back in 2008, India launched the National Action Plan on Climate Change which outlines policies directed at mitigation and adaptation to climate change. In its eight national missions, the national Action Plan proposes an extensive range of measures with focus on renewable energy, energy efficiency, clean technologies, public transport, resource efficiency, afforestation, tax incentives and research and generation of strategic knowledge. India's Twelfth Five Year Plan covering the period 2012 to 2017 calls for faster, more inclusive and sustainable growth.

I am happy to note that the publication on "India's Progress in Combating Climate Change" for COP-20 captures a snapshot of the plethora of initiatives for tackling climate change in India and lucidly depicts several initiatives and innovations in various sectors to demonstrate India's sustained efforts towards reducing its emission intensity of Gross Domestic Product (GDP).

Adaptation and mitigation responses are underpinned by common enabling factors which include effective institutions and governance, adequate and long term financing in environmentally sound technologies and infrastructure, sustainable livelihoods, and behavioural and lifestyle choices. In this context, it is notable that the India Country Paper has highlighted the scale of financial resources needed for addressing the cross cutting issues and challenges of climate change in the country. It would now be upto the ongoing Meeting of the Conference of Parties (COP-20) to the United Nations Framework Convention on Climate Change (UNFCCC) in Lima, Peru to generate the necessary trust, confidence and momentum amongst nations that will ensure not only the provisioning of adequate, predictable and long term finance but also development and diffusion of clean technology to the developing and vulnerable countries to help enhance the efforts undertaken so far .

(Prakash Javadekar)

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## PREFACE

Climate Change is one of the most formidable developmental challenges faced by humanity today. Its consequences are global and intergenerational. The impact of climate change tends to be more pronounced for the disadvantaged, making them even more vulnerable to climate risks. Developing countries are especially vulnerable, many with limited capacity to adapt to rising sea levels or recover from associated losses. The priority concern for such countries is how to build resilience to climate change impacts already set in motion by past greenhouse gas emissions. Globally, the response strategies of mitigation and adaptation represent the core of global efforts to tackle climate change.

This publication attempts to present a range of initiatives highlighting enhanced actions in the area of mitigation and adaptation in India. It addresses the policy designs and their implementation in various sectors which include inter alia; renewable energy, energy efficiency, water management and development of strategic knowledge to combat the impacts of climate change that can no longer be prevented. The briefing paper on "India's Progress in Combating Climate Change" sends an encouraging message about the engagement of Government of India in collaborating with various state and non state actors to step up cooperation on climate change related programmes. The paper also outlines the huge challenges of financial requirements needed for the development of climate resilient infrastructure, clean technologies and capacity building in India.

I hope that the ongoing deliberations in Lima will chart a clear road map for enhancing the ambitions for the means of implementations under the mandate of UNFCCC.

  
(Ashok Lavasa)



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# India's Intended Nationally Determined Contribution for the 2015 Agreement Under UNFCCC

Conference of Party of UNFCCC at 19th Session held in Warsaw in November 2013 in Para 2(b) of Decision 1/CP.19 invited all Parties to initiate or intensify domestic preparations for their Intended Nationally Determined Contributions (INDC), without prejudice to the legal nature of contribution, in the context of adopting a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties towards achieving the objective of the Convention as set out in its Article 2 and to communicate them well in advance of the 21st Session of the COP (by the first quarter of 2015 by those Parties ready to do so) in a manner that facilitates the clarity, transparency and understanding of the intended contributions, without prejudice to legal nature of the contributions.

As a follow up to the above Decision, steps have been taken to finalize India's INDC on mitigation, adaptation, finance, technology and capacity building. The comprehensive INDC would also project the requirement of support in terms of finance & technology transfers, etc. It would cover all the national missions and other initiatives under National Action Plan on Climate Change as well as State Action Plan on Climate Change.

The contributions will factor in India's domestic obligations of addressing the basic development needs in terms of achieving minimum standards of living for its entire population. The contributions will take in to account the imperatives for addressing the challenges of poverty eradication, food security and nutrition, universal access to education and health, gender equality and women empowerment, water and sanitation, energy, employment, sustainable cities and human settlement and last but not the least, the means of implementation for enhanced action for achieving among others sustainable development goals.

# Prime Minister's Council on Climate Change

A high Level advisory group on climate change was constituted in June 2007 and reconstituted in November 2014 with the following objectives:

- (i) Coordinate national action plans for assessment, adaptation and mitigation of climate change.
- (ii) Advise government on pro-active measures that can be taken by India to deal with the challenge of climate change.
- (iii) Facilitate inter-ministerial coordination and guide policy in relevant areas.

The composition of Prime Minister's Council on Climate Change is as follows:

1. Prime Minister (Chairperson)
2. Minister of External Affairs (Member)
3. Finance Minister (Member)
4. Minister of Environment, Forests and Climate Change (Member)
5. Minister for Water Resources, River Development and Ganga Rejuvenation (Member)
6. Minister for Agriculture (Member)
7. Minister for Urban Development (Member)
8. Minister for Science and Technology (Member)
9. Minister of State for Power, Coal and New and Renewable Energy (Member)
10. Cabinet Secretary (Member)
11. Foreign Secretary (Member)
12. Secretary, Ministry of Environment, Forests and Climate Change (Member)
13. Dr. R. K. Pachauri, Director General, TERI (Member)
14. Shri Nitin Desai, Distinguished Fellow, TERI (Member)
15. Shri Chandrashekhar Dasgupta (Member)
16. Shri Ajay Mathur, Director General, BEE (Member)
17. Shri J.M. Mauskar (Member)
18. Principal Secretary to Prime Minister (Member Convenor)



## National Action Plan on Climate Change

**L**aunched in 2008, India's National Action Plan on Climate Change (NAPCC) identifies a number of measures that simultaneously advance the country's development and climate change related objectives of adaptation and mitigation.

The implementation of the NAPCC is designed to take place through eight National Missions, which form the core of the National Action Plan and incorporate multi-pronged, long-term and integrated strategies for achieving India's key goals in the context of climate change.

# Jawaharlal Nehru National Solar Mission

## Mission Objective

To establish India as a global leader in solar energy, by creating the policy conditions for its diffusion across the country as quickly as possible.

## Mission Targets and Timeline

The Mission has adopted a three phase approach. The first phase (2010-2013) was designed to focus on capturing the low-hanging options in solar thermal; promoting off-grid systems to serve populations without access to commercial energy and modest capacity addition in grid-based systems. In the second (2013-2017) and third (2017-2022) phases, capacity will be aggressively ramped up to create conditions for scaled-up and competitive solar energy penetration in the country. To achieve this, the mission targets that by year 2022 it will:

- Create an enabling policy framework for the deployment of 20,000 MW of solar power
- Create favourable conditions for solar manufacturing capability, particularly solar thermal for indigenous production and market leadership

- Promote programmes for off grid applications reaching 2,000 MW
- Achieve 20 million sq. meters solar thermal collector area
- Deploy 20 million solar lighting systems for rural areas

## Budgetary Requirements and Allocations

The budgetary allocation for the 12th five year plan (2012-2017) is INR 8,795 crore (approx. USD 1.4 billion).

## Implementation Status

Key achievements to date:

- Installed 2,970 MW of grid-connected solar generation capacity
- Installed 364 MW of off-grid solar generation capacity
- Installed 8.42 million sq. meters of solar thermal collectors



# National Mission for Enhanced Energy Efficiency

## Mission Objective

To achieve growth with ecological sustainability by devising cost effective and energy efficient strategies for end-use demand side management.

## Mission Targets and Timeline

To achieve its objective, the mission focuses on the following initiatives:

- Perform Achieve and Trade (PAT): A market-based mechanism to facilitate energy efficiency improvements in large energy intensive industries and facilities, by issuing energy saving certificates that can be traded
- Market Transformation for Energy Efficiency (MTEE): Accelerating the shift to energy-efficient appliances and equipments in designated sectors through innovative measures that make such products more affordable
- Energy Efficiency Financing Platform (EEFP): Creating mechanisms to finance demand side management programmes in all sectors of the economy by capturing future energy savings
- Framework for Energy Efficient Economic Development (FEEED): Developing fiscal instruments to promote energy efficiency

By 2015, implementation of the mission is expected to deliver estimated fuel savings of about 23

million tonnes of oil-equivalent every year, along with avoided capacity addition of over 19,000 MW. The resultant annual reduction in carbon dioxide emissions is estimated to be around 98.55 million tonnes.

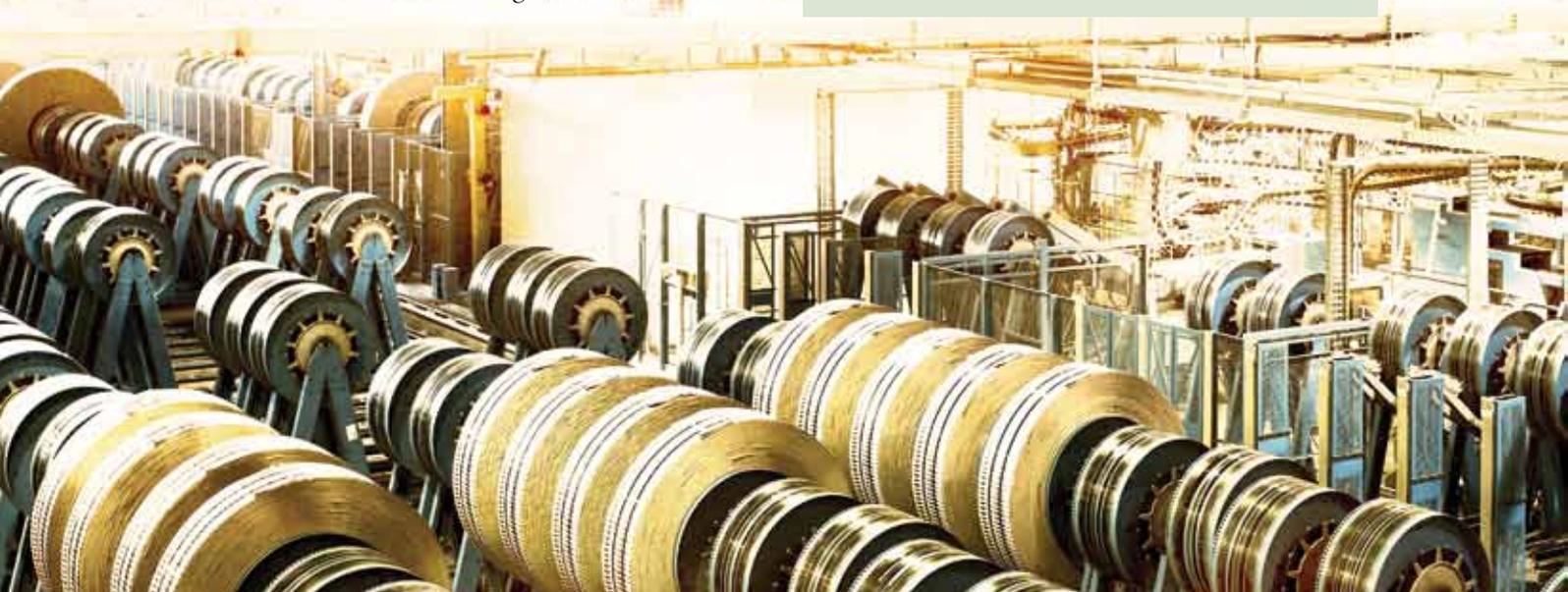
## Budgetary Requirements and Allocations

The total funding requirement assessed for the 12th five year plan period (2012-2017) is INR 190 crore (approx. USD 31 million).

## Implementation Status

Key achievements to date:

- PAT cycle-1 launched and expected to be completed successfully by March 2015. Covers 478 plants in 8 energy intensive industrial sectors that account for one-third of total energy consumption
- Distributed 2.58 million LED bulbs (7 watts); cost of an LED bulb reduced from INR 500 to INR 204 (approx. USD 8 to USD 3)
- Super-efficient ceiling fans to be introduced in the market by 2015



# National Mission on Sustainable Habitat

## Mission Objective

To promote sustainability of habitats through improvements in energy efficiency in buildings, urban planning, improved management of solid and liquid waste including recycling and power generation, modal shift towards public transport and conservation.

## Mission Targets and Timeline

To achieve its objective, the mission targets are:

- Extension of the Energy Conservation Building Code, which addresses the design of new and large commercial buildings to optimise their energy demand. Incentives will be provided for re-tooling existing building stock.
- Better urban planning and modal shift to public transport by making long term transport plans to facilitate the growth of medium and small cities in such a way that ensures efficient and convenient public transport.
- Recycling of material and urban waste management under which a special area of focus will be development of technology for producing power from waste. The mission will include a major R&D programme, focussing on bio-chemical conversion, waste water use, sewage utilisation and recycling options wherever possible.

The mission includes timelines for all the strategies and sub-components of each strategy. These range between 2009 to 2017.

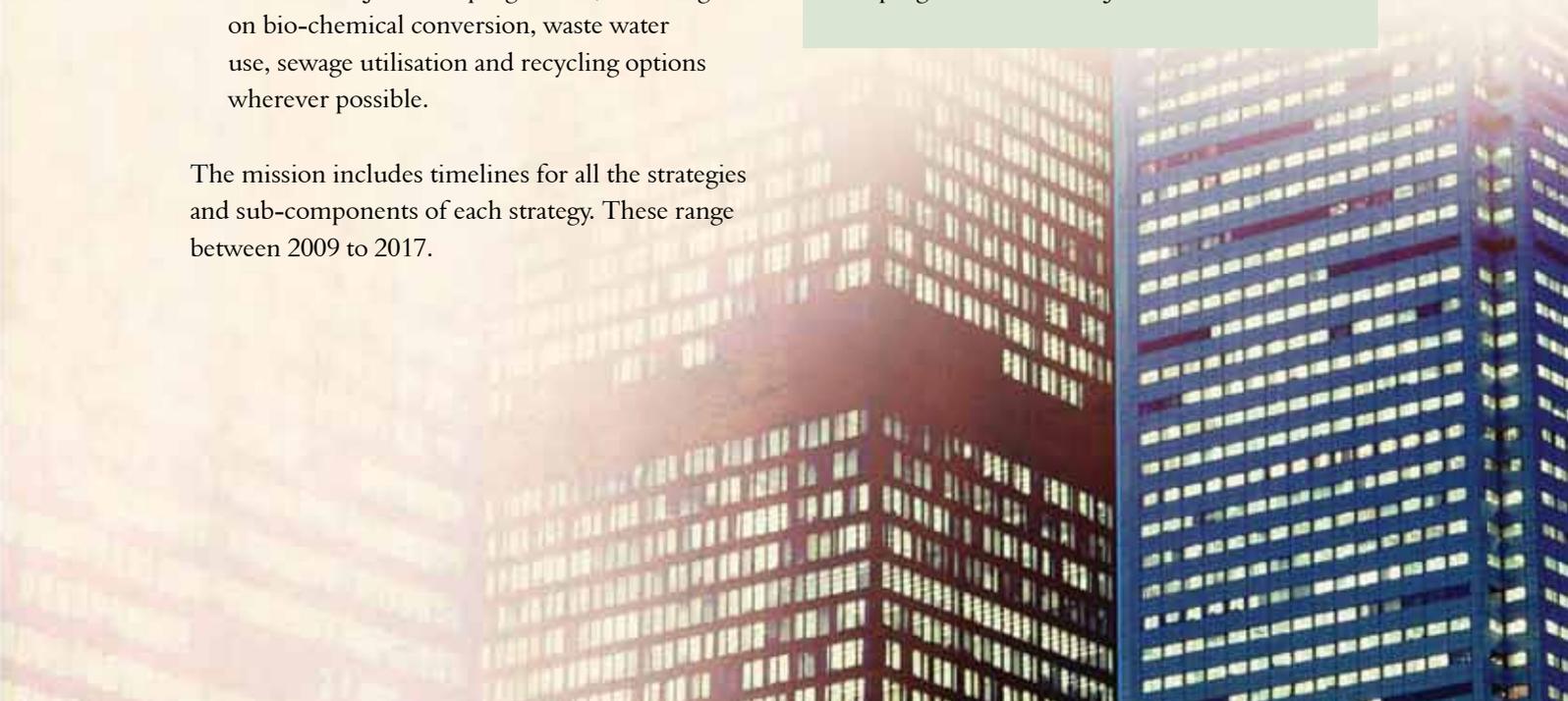
## Budgetary Requirements and Allocations

The total funding requirement assessed for the 12th five year plan period (2012-2017) is INR 950 crore (approx. USD 153 million), which is to be met from existing budget of the Jawaharlal Nehru National Urban Renewable Mission (JNNURM).

## Implementation Status

Key achievements to date:

- Energy Conservation Building Code 2007 made mandatory for new as well as old buildings; incorporated in Central Public Works Department (CPWD) General Specification for Electrical Works in 2013
- More than 50 capacity building programmes in various stages of implementation
- Long term transport plan for cities prepared
- Sanctioned 760 water supply projects at an estimated cost of INR 35,650 crore (approx. USD 5.75 billion) under ongoing programmes such as JNNURM





## National Water Mission

### Mission Objective

To conserve water, minimise wastage and ensure equitable distribution both across and within states through integrated water resources development and management.

### Mission Targets and Timeline

To achieve its objective, the mission targets are:

- Development of comprehensive water database in public domain and assessment of impact of climate change on water resources
- Promotion of citizen and state actions for water conservation, augmentation and preservation
- Focused attention to vulnerable areas including over-exploited areas
- Increase water use efficiency by 20%
- Promotion of basin level integrated water resources management

### Budgetary Requirements and Allocations

The mission requires budgetary support of INR 89,101 crore (approx. USD 14.4 billion) during the 11th (2007-2012) and 12th (2012-2017) five year plan periods. Proposals for INR 196 crore (approx. USD 31.6 million) have been approved.

### Implementation Status

Key achievements to date:

- Revised National Water Policy (2012) adopted by National Water Resources Council
- Created 1,082 new Ground Water Monitoring Wells
- Several capacity building and training programmes are underway

# National Mission for Sustainable Agriculture

## Mission Objective

To transform agriculture into an ecologically sustainable climate resilient production system while at the same time, exploiting its fullest potential and thereby ensuring food security, equitable access to food resources, enhancing livelihood opportunities and contributing to economic stability at the national level.

## Mission Targets and Timeline

To achieve its objective, the mission will work on the following major programme components or activities:

- **Rainfed Area Development:** Adopt an area based approach for development and conservation of natural resources along with farming systems
- **On-Farm Water Management:** Enhance water use efficiency by promoting efficient on-farm water management technologies and equipment
- **Soil Health Management:** Promote location as well as crop specific sustainable soil health management
- **Climate Change and Sustainable Agriculture - Monitoring, Modelling and Networking:** Creation and bidirectional (farmers to research institutions and vice versa) dissemination of climate change related information and knowledge

## Budgetary Requirements and Allocations

The mission requires budgetary support of INR 1,08,000 crore (approx. USD 17.4 billion) up to the end of 12th five year plan period (2011-2017). Proposals for INR 13,034 crore (approx. USD 2.1 billion) have been approved.

## Implementation Status

Key achievements to date:

- Developed 11,000 hectares of degraded land
- 1 million hectares brought under micro-irrigation to promote water efficiency
- Created 5.4 million metric tonne agricultural storage capacity

# National Mission for Sustaining the Himalayan Ecosystem

## Mission Objective

To evolve management measures for sustaining and safeguarding the Himalayan glaciers and mountain ecosystem and attempt to address key issues namely impacts of climate change on the Himalayan glaciers, biodiversity, wildlife conservation and livelihood of traditional knowledge societies.

## Mission Targets and Timeline

To achieve its objective, the mission targets (selected) are:

- Creation of a fund (approx. INR 1,650 crore or USD 266 million) for developing capacities for Sustaining Himalayan Ecosystem.
- Establishment of a State of the Art National Centre for Himalayan Glaciology.
- Identification and networking of all knowledge institutions in the region which possess the institutional capacity for studies on Himalayan ecosystems.
- Establishment of about 10 new centres in existing institutions in areas of knowledge gaps complete with special mechanisms and tools to create knowledge capacity for sustaining Himalayan ecosystems.
- Annual status reports on the health of various sub-components of the Himalayan ecosystems and bi-annual advisories to the Himalayan Sustainable Development Forum through state councils for climate change in the Indian Himalayan states for actions for implementation.
- Standardisation of data collection systems for interoperability and mapping of natural resource wealth systems.

- Identification and training of about 100 experts and specialists in areas relevant to sustaining the Himalayan ecosystem including about 25 glaciologists.
- Conduct 25 programmes on capacity building for linking innovations from traditional and modern knowledge systems.
- Establishment of an observational network for monitoring and forewarning of changes in the ecosystems of the Himalayan region.

## Budgetary Requirements and Allocations

The total funding requirement for 2010 to 2017 is INR 1,695 crore (approx. USD 273 million). Proposals for INR 500 crore (approx. USD 81 million) have been approved.

## Implementation Status

Key achievements to date:

- Established 6 new centres relevant to climate change in existing institutions in Himalayan states
- Created an observational network to monitor the health of the Himalayan ecosystem
- Several capacity building and training programmes underway



## National Mission for a Green India

### Mission Objective

To use a combination of adaptation and mitigation measures in enhancing carbon sinks in sustainably managed forests and other ecosystems, adaptation of vulnerable species/ecosystems, and adaptation of forest-dependent communities.

### Mission Targets and Timeline

To achieve its objective, the mission targets are:

- Increase forest/tree cover on 5 million hectares of forest/non-forest lands and improve quality of forest cover on another 5 million hectares.
- Improve ecosystem services including biodiversity, hydrological services and carbon sequestration through treatment of an area of 10 million hectares.
- Increase forest-based livelihood income of about 3 million households living in and around the forests.
- Enhance annual CO<sub>2</sub> sequestration by 50 to 60 million tonnes in the year 2020

The implementation of the mission will spread over 10 years, coinciding with the 12th (2012-2017) and 13th (2017-2022) five year plan periods.

### Budgetary Requirements and Allocations

The total mission cost is estimated to be INR 46,000 crore (approx. USD 7.4 billion). Funding of INR 13,000 crore (approx. USD 2.1 billion) has been approved for implementation of various activities under the mission.

### Implementation Status

Key achievements to date:

- Preparatory activities underway in 27 Indian states
- 11 Indian states have submitted perspective plans that cover 33 landscapes and working area of 85,000 hectares
- Finalised implementation guidelines after extensive consultations with state governments and civil society

# National Mission on Strategic Knowledge for Climate Change

## Mission Objective

To identify the challenges and the responses to climate change through research and technology development and ensure funding of high quality and focused research into various aspects of climate change.

## Mission Targets and Timeline

To achieve its objective, the mission targets are:

- Form well designed knowledge networks with a well structured framework for harmonisation, interoperability, sharing and exchange of data of relevance to climate change and responses
- Enhance the research capability in climate science
- Position a technology watch system for key sectors related to economic development, likely to be affected by climate change.
- Leverage development of suitable technologies for adaptation and mitigation of climate change under various missions
- Assist other agencies engaged in the implementation of the National Action Plan on Climate Change and supporting the actions under the other Missions, as and if necessary

## Budgetary Requirements and Allocations

The total funding requirement for the 12th five year plan period (2012-2017) is INR 2,500 crore (approx. USD 403 million). The allocations to undertake these mission activities will be met out of the budget allocation of the existing scheme of the Department of Science and Technology, Government of India.

## Implementation Status

Key achievements to date:

- Established 12 thematic knowledge networks
- Developed 3 regional climate models
- Trained 75 high quality climate change professionals



# Other National and Sub National Initiatives

**I**n addition to the National Action Plan on Climate Change, the Government of India has taken several other measures to promote sustainable development and address the threat of climate change. These initiatives operate

at the national and sub national level and span domains that include climate change research, clean technology research and development, finance, and energy efficiency and renewable energy policy and deployment.



## National Clean Energy Fund

The Government of India created the National Clean Energy Fund (NCEF) in 2010 for the purpose of financing and promoting clean energy initiatives and funding research in the area of clean energy in the country. The corpus of the fund is built by levying a cess of INR 50 (subsequently increased to INR 100 in 2014) per tonne of coal produced domestically or imported.

Till date, Viability Gap Funding (VGF) of INR 16,511.43 crore (USD 2.75 billion) has been recommended from the NCEF for 46 projects. NCEF is financing innovative schemes like Jawaharlal Nehru National Solar Mission (JNNSM)'s installation of solar photovoltaic (SPV) lights and small capacity lights, installation of SPV water pumping as well as other mission projects under the National Action Plan on Climate change (NAPCC) and projects relating to R&D to replace existing technologies with more environment friendly ones under National Mission on Strategic Knowledge for Climate Change (NMSKCC). The scope of NCEF has also been enlarged to cover other eligible projects of the Ministry of New and Renewable Energy (MNRE), which are being

### National Adaptation Fund

On July 10, 2014 the Honourable Finance Minister of India announced an allocation of INR 100 crore (USD 16.67 million) towards a newly established National Adaptation Fund. This fund will assist national and state level activities to meet the cost of adaptation measures in areas that are particularly vulnerable to the adverse effects of climate change.

implemented under the flagship programmes of “Grid Interactive and Distributive Renewable Power” and “Research Design, Development in Renewable Energy”.

In 2014, the Government of India expanded the scope of the NCEF to include financing and promoting clean environment initiatives and funding research in the area of clean environment. To finance these additional initiatives, the Clean Energy Cess has been increased from INR 50 per tonne to INR 100 per tonne of coal.

### NCEF Funds Recommended to Projects by Year

Financial Year	Number of Projects	Amount Approved (INR Crore)	Amount Approved (USD Million)
2011-12	9	566.50	94.42
2012-13	6	2,715.11	452.52
2013-14	12	1,229.65	204.94
2014-15	19	12,000.17	2,000.03
Total	46	16,511.43	2,751.91

### Recent Projects Recommended for NCEF Funding (2014)

Ministry	Project	Amount Approved (INR Crore)	Amount Approved (USD Million)
MNRE	52 MWp Grid Connected Rooftop SPV Plants through Multi Govt. Agencies	143.20	23.87
MNRE	54 MWp Grid Connected Rooftop SPV Power Plants through State Nodal agencies	149.85	24.98
MNRE	Installation of 5 lakh sq. m. collector area Solar Water Heating System in Domestic & Building Sector	142.50	23.75
MNRE	Setting up 1,000 MW of Grid-connected Solar PV Power Projects by Establishments of Ministry of Defence	1,250.00	208.33
MNRE	25 MWp SPV Plan through SNA's and channel partners	142.50	23.75
MNRE	Generation Based Incentive (GBI) for grid connected wind power projects	741.00	123.50
MoHI&PE	Solar PV Manufacturing Plant of BHEL	1,092.22	182.04
MNRE	Installation of 8,500 SPV water Pumping System	148.26	24.71
MNRE	73 MWp Grid Connected Rooftop SPV Power Plants in the Warehouses through Solar Energy Corporation of India (SECI)	148.92	24.82
MNRE	Setting up 1,000 MW of Grid-connected Solar PV Power Project by CPSUs	1,000.00	166.67
MNRE	Revised proposal for NCEF funding of 960 crore for pilot grid connected solar thermal projects	960.00	160.00
MNRE	IREDA to lend on to viable RE projects under NCEF	2,500.00	416.67
MNRE	Intra-State Transmission System for Renewable Power Evacuation in Rajasthan	402.52	67.09
MNRE	Intra-State Transmission System for Renewable Power Evacuation in Tamil Nadu	637.20	106.20
MoEF&CC	12 MW Ghazipur Municipal Solid Waste (MSW) to Energy Project.	120.00	20.00
MNRE	Installation of solar power generator above 3 Wp up to size of 100 kWp ( with or without battery) with aggregate capacity of 25 MWp through SNA's and channel partners	142.50	23.75
MNRE	Solar Electrification of 1,000 villages under JNNSM	154.50	25.75
MNRE	Provision of solar power in border areas	25.00	4.17
MNRE	Setting up of 1,000 MW of grid connected solar PV power projects with Viability Gap Funding under Jawaharlal Nehru National Solar Mission (JNNSM)	2,100.00	350.00
Total		12,000.17	2,000.03

MNRE: Ministry of New and Renewable Energy  
 MoEF&CC: Ministry of Environment, Forests and Climate Change  
 MoHI&PE: Ministry of Heavy Industries and Public Enterprises

## State Action Plan on Climate Change

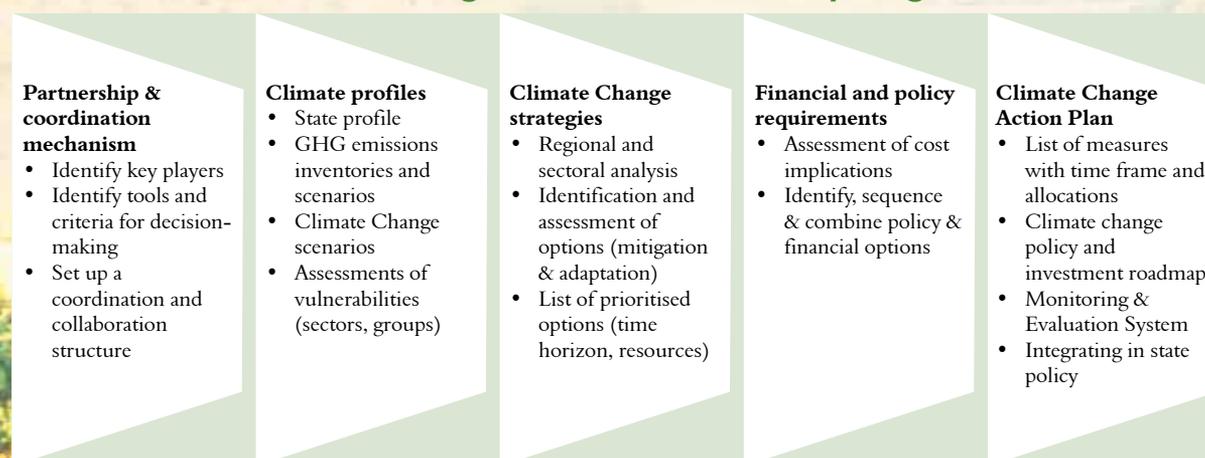
In 2008, the Government of India launched the National Action Plan on Climate Change (NAPCC) establishing eight priority missions. For the realisation of these proposed actions at the sub national level, in August 2009 the Prime Minister of India called upon State Governments to prepare their own State Action Plan on Climate Change (SAPCC) consistent with strategies in the NAPCC.

A common framework for the preparation of SAPCC was developed to harmonise national and state level actions. The common framework drew largely on the principles of territorial approach to climate change which focused on sub national planning, building capacities for vulnerability assessment and identifying investment opportunities based on the state's priorities. The framework provided broad, systematic and step-wise process (see figure) for the preparation of

SAPCC and advocated a participatory approach so that states have enough ownership for the process and the final Plan. The recommended approach retained a level of flexibility in order to integrate state level variations in ecosystems, geographic conditions, socio-economic scenario, and other factors.

Till date, 30 states have prepared their State Action Plan. The SAPCCs have both adaptation and mitigation component to address climate change impacts, though adaptation has been identified as a more important element of the Plan. These plans have been reviewed and endorsed by the Expert Committee on Climate Change under the Ministry of Environment, Forests & Climate Change, Government of India. A combined budgetary requirement of INR 11.32 lakh crore (USD 188.66 billion) has been assessed for implementation of SAPCCs.

### Recommended Logical Framework for Preparing SAPCC



### Budget Requirements of State Governments for Implementing SAPCCs

S. No.	States	Budget Requirement for 5 years (INR Crore)	Budget Requirement for 5 years (Million USD)
1	Andaman & Nicobar Islands	440	73
2	Andhra Pradesh	3,19,471	53,245
3	Arunachal Pradesh	11,332	1,889
4	Assam	Not Available	Not Available
5	Bihar	2,142	357
6	Chhattisgarh	9,900	1,650
7	Delhi	Not Available	Not Available
8	Gujarat	21,059	3,510
9	Haryana	56,565	9,428
10	Himachal Pradesh	1,560	260
11	Jammu and Kashmir	67,394	11,232
12	Jharkhand	3,179	530
13	Karnataka	7,120	1,187
14	Kerala	2,938	490
15	Lakshadweep	Nil	Nil
16	Madhya Pradesh	4,708	785
17	Maharashtra	Not Available	Not Available
18	Manipur	3,917	653
19	Meghalaya	6,298	1,050
20	Mizoram	3,675	613
21	Nagaland	3,778	630
22	Odisha	17,032	2,839
23	Puducherry	825	138
24	Punjab	58,796	9,799
25	Rajasthan	262	44
26	Sikkim	76,095	12,682
27	Tamil Nadu	4,02,928	67,155
28	Tripura	23,428	3,905
29	Uttarakhand	8,833	1,472
30	West Bengal	18,271	3,045
	<b>Total</b>	<b>11,31,945</b>	<b>188,658</b>

## NABARD: Progressing Adaptation Actions

India's National Bank for Agriculture and Rural Development (NABARD) has been accredited as a National Implementing Entity (NIE) for India for the Adaptation Fund created under the United Nations Framework Convention on Climate Change (UNFCCC). At present, NABARD is the only NIE in the Asia-Pacific Region.

In its capacity as NIE, NABARD has generated several feasible projects on climate change adaptation in diverse agro-climatic regions and livelihood sectors, five of which have been submitted as proposals to the Adaptation Fund amounting to USD 7.3 million. The Adaptation Fund Board (AFB) in its 24th meeting held on 9th October 2014 sanctioned the first set of two projects submitted by NABARD with an outlay of USD 3.2 million for promoting climate resilient agriculture systems in West Bengal and enabling the fisheries sector in Andhra Pradesh to respond to the challenge posed by sea level rise.

Additionally, NABARD is implementing several developmental projects to promote sustainable livelihoods through Natural Resource Management (NRM) such as watershed development and sustainable livelihood for tribal communities, which are helping build climate change resilience and adaptive capacities of rural communities. NABARD has sanctioned a pilot project of INR 21 Crore (USD 3.5 million) on climate change adaptation in Ahmednagar (Maharashtra) to develop knowledge, strategies and approaches that will enable vulnerable communities to adapt to the impending impacts

of climate change such as delays in onset and withdrawal of the monsoon, changes in temperature and unseasonal rainfall. Pilot projects on climate proofing of watersheds in Tamil Nadu and Rajasthan are also underway.

NABARD has also financed projects that improve energy efficiency. In the state of Karnataka, energy inefficient pumps were replaced by more efficient ones through a loan assistance programme. Under the NABARD Infrastructure Development Assistance (NIDA), NABARD is financing green investments on solar power generation and improvement of electricity distribution networks, which includes India's first one MW canal-top solar power project in the state of Gujarat.

NABARD is collaborating with non-governmental organisations, research institutions and government departments to conduct training programmes and workshops. These are building the capacities of NABARD's partners and stakeholders to understand the adverse impacts of climate change on natural and human systems and to design appropriate adaptation measures.

The experience gained by NABARD as NIE has enabled the institution to adopt processes and procedures that are followed internationally in the development, review and sanctioning of projects. NABARD continues to develop quality projects to create a pipeline of feasible projects that will help communities in India take measures to adapt to the impacts of climate change.



## Auto Fuel Vision and Policy 2025

In December 2012, the Government of India constituted an Expert Committee for drafting the Auto Fuel Vision and Policy-2025 for the country. The mandate of the Expert Committee was to recommend a roadmap for improving auto fuel quality in India till 2025, as well provide recommendations on other issues, including suitable mix of auto fuels, vehicular emission norms for various categories of vehicles, use of alternate fuels and fiscal measures for funding requisite technology upgrades.

The Expert Committee submitted its report in May 2014 and recommended a roadmap for rolling out Bharat Stage-IV (BS-IV), equivalent of Euro-IV, by 2017 and BS-V (Euro-V) auto fuels by 2020 in the entire country. The estimated investment for creating new facilities to produce BS-IV and BS-V auto fuels is approximately INR 80,000 crore (approx. USD 12.9 billion). The Committee also recommended the institutionalisation of an effective system for Inspection & Maintenance (I&M) regime for in-use vehicles and introduction of a policy for phasing out of older commercial vehicles. Additionally, the Committee suggested that emission norms for two-wheeler, three-wheeler, passenger cars/light commercial vehicles and heavy duty vehicles be prescribed.

Based on the recommendations of the Expert Committee, the Government of India has set a target of providing BS-IV auto fuels in the entire country by August 2017 using a phased approach for implementation.

### Fuel Consumption Standards for Cars

The Government of India issued average fuel consumption standards for cars in January 2014. The standards will require Corporate Average Fuel Consumption of cars to be less than or equal to 5.49 litres/100 km from 2016-17 and less than or equal to 4.77 litres/100 km from 2021-22. Introduction of these standards is expected to lead to a reduction of 22.97 million tonnes of fuel consumption by 2025.

This decision continues a process that began in 2001, when an Expert Committee was first constituted to recommend an Auto Fuel Policy for the country. The expert committee recommended that the Government of India supply BS-IV auto fuels in the National Capital Region and 13 other cities and BS-III auto fuels in the rest of the country by 2010. Till date, the supply of BS-IV auto fuels have been expanded to 39 cities in India. It is estimated that the Indian Oil Marketing Companies (OMCs) have invested about INR 30,000 crore (approx. USD 4.84 billion) in auto fuel up-gradation projects so far.

## Indian Network for Climate Change Assessment

To enhance knowledge about the impacts of climate change at the national and sub national level, Indian Network for Climate Change Assessment (INCCA) was launched on October 14, 2009.

INCCA has been conceptualised as a network-based scientific programme designed to:

1. Assess the drivers and implications of climate change through scientific research
2. Prepare climate change assessments once every two years (greenhouse gas estimations and impact of climate change, associated vulnerabilities and adaptation)
3. Develop decision support systems
4. Build capacity towards management of climate change related risks and opportunities

The programmes envisaged under the aegis of INCCA include those on Black Carbon, Ecosystem Monitoring, Centre for Advance Studies, Impact Assessments, Greenhouse Gas Inventory Programme, Integrated Vulnerability & Adaptation (V&A) Assessments and Developing Scenarios.

Under the Greenhouse Gas Inventory Programme, a report on 'India's Greenhouse Gas Emission – 2007' was published in May 2010. This report contains updated information on India's greenhouse gas emissions for the year 2007. The assessment was prepared by 83 experts belonging to 19 institutions from across the country.

### National Institute for Climate Change Studies and Actions

A new National Institute for Climate Change Studies and Actions (NICCSA) is being set up by the Government of India under the Climate Change Action Programme (CCAP) of the Ministry of Environment, Forests and Climate Change. The Institute will conduct analytical studies on scientific, environmental, economic development and technological issues related to climate change.

Under the Impact Assessments Programme, a "Climate Change in India: 4x4 Assessment" has been undertaken to ascertain impacts in 2030s. This assessment brings together four major regions in India, namely, Himalayan region, the North-Eastern region, the Western Ghats and the Coastal Region in regard to observed climate and climate change projections in the year 2030 on 4 key sectors of agriculture, water, natural ecosystem, and biodiversity and health.

The National Carbonaceous Aerosols Programme (NCAP) aims to enhance the understanding of the role of carbonaceous aerosols on climate change, to prepare an inventory of black carbon emissions in the country and to assess its impacts on glacier melting. The science plan for the "Black Carbon Research Initiative-National Carbonaceous Aerosols Programme (NCAP)" was launched in March 2011.



# Expert Group on Low Carbon Strategies for Inclusive Growth

The Expert Group on Low Carbon Strategies for Inclusive Growth was set up by the Planning Commission, Government of India, in 2010 to suggest low carbon pathways consistent with inclusive growth in India. The high-level Expert Group was composed of representatives from relevant government ministries, industry, think tanks and research institutions.

The Expert Group was required to report on the following:

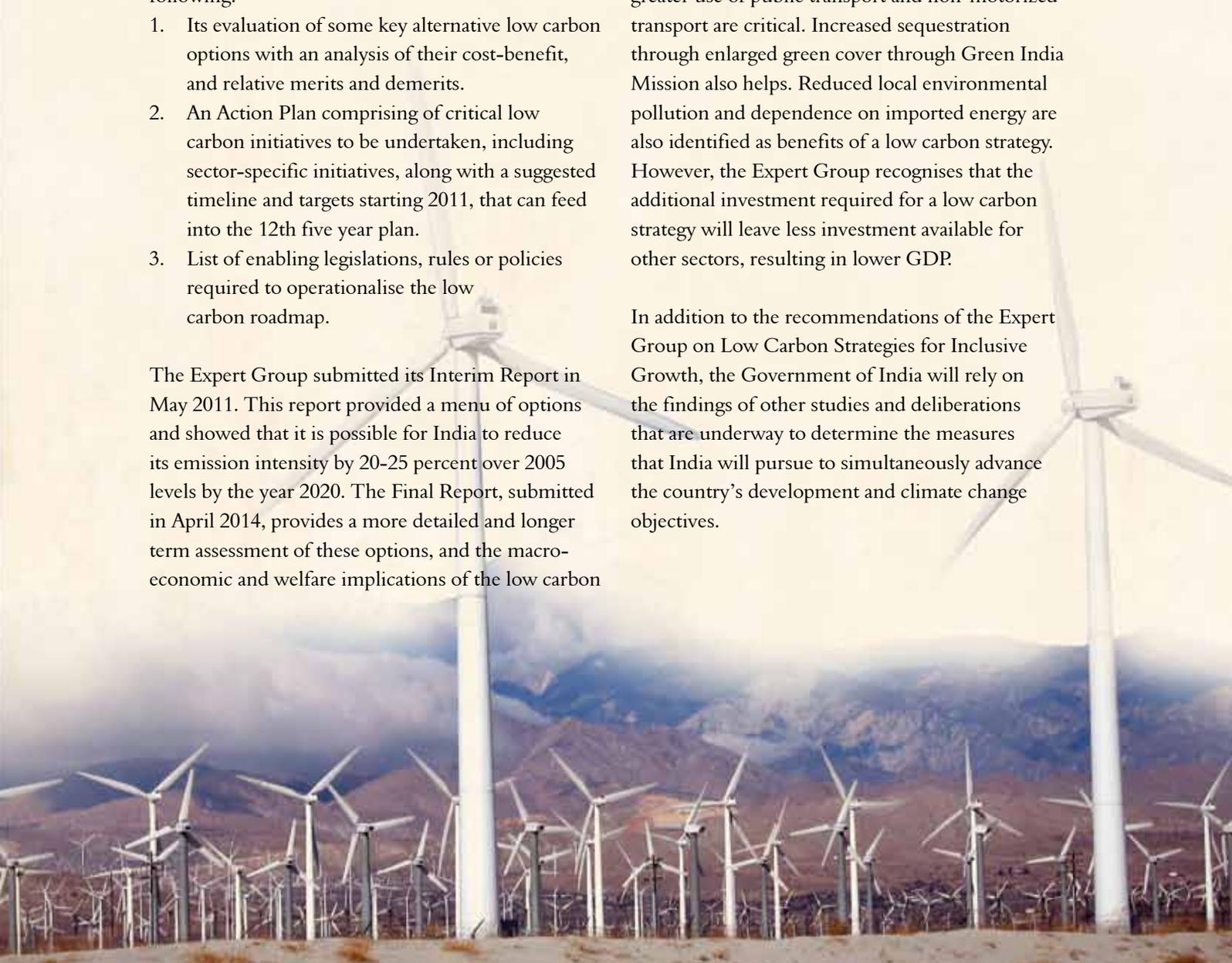
1. Its evaluation of some key alternative low carbon options with an analysis of their cost-benefit, and relative merits and demerits.
2. An Action Plan comprising of critical low carbon initiatives to be undertaken, including sector-specific initiatives, along with a suggested timeline and targets starting 2011, that can feed into the 12th five year plan.
3. List of enabling legislations, rules or policies required to operationalise the low carbon roadmap.

The Expert Group submitted its Interim Report in May 2011. This report provided a menu of options and showed that it is possible for India to reduce its emission intensity by 20-25 percent over 2005 levels by the year 2020. The Final Report, submitted in April 2014, provides a more detailed and longer term assessment of these options, and the macro-economic and welfare implications of the low carbon

strategy.

The Expert Group gives high priority to inclusive growth and notes that pursuit of low carbon development is consistent with growth and inclusion. In the low carbon strategy assessed, energy efficiencies in households, buildings, industry and transport play important roles. At the same time low carbon supply technologies, such as solar and wind in the power sector, and greater use of public transport and non-motorized transport are critical. Increased sequestration through enlarged green cover through Green India Mission also helps. Reduced local environmental pollution and dependence on imported energy are also identified as benefits of a low carbon strategy. However, the Expert Group recognises that the additional investment required for a low carbon strategy will leave less investment available for other sectors, resulting in lower GDP.

In addition to the recommendations of the Expert Group on Low Carbon Strategies for Inclusive Growth, the Government of India will rely on the findings of other studies and deliberations that are underway to determine the measures that India will pursue to simultaneously advance the country's development and climate change objectives.



## Bilateral Cooperation on Environment and Clean Technology

India has been successful in establishing bilateral relations with several countries on key areas of development and growth. One such area

that has gained prominence in last few decades is environment and clean technology. Following are some of the major agreements in this area.

Country	Brief Objectives of the Memorandum of Understanding	Key Outcomes Achieved
Canada	In 2007, India and Canada signed a Joint Statement on India-Canada Forum on Environment Cooperation. The Forum facilitates public private partnerships in relevant areas, encourages environmental cooperation and aims at promoting knowledge exchange, technology transfer, capacity building and business partnerships.	The Indian-Canada Environment Forum has held several meetings and an international workshop was organised as well. These provided the opportunity to explore areas for future collaboration between the two countries. Integrated water management for the Ganga Basin has been identified as an avenue for collaboration.
Finland	India and Finland have set up a Joint Working Group (JWG) on Clean Technologies and Waste Management under the Bilateral Joint Economic Commission. It aims to promote knowledge sharing, create favourable conditions for collaboration, support investments and R&D cooperation, and industry engagement.	The JWG has had several meetings and both sides have agreed upon a JWG action plan. The countries will support each other in jointly promoting their areas of expertise in the field of clean technologies, including waste management, water, renewable energy, energy efficiency and sustainable forestry in India and in third countries.
France	In 2008, India and France issued a Joint Statement at the 15th Session of the India-France Joint Committee stipulating the creation of a Joint Working Group on Environment dealing mainly with Clean Technology transfers and their financing.	Through several JWG meetings, promotion of renewable energy technologies was identified as an area of mutual interest. This led to a proposal for setting a sub-group on "Clean Energy Technology".
Norway	In 2004, a Joint Commission of Cooperation was established between India and Norway. Under this environment management is a key area of cooperation which includes relevant technologies and natural resources management. Subsequently, in 2006 a Joint Working Group on Environment was established.	In collaboration with the Norwegian Government, the "Centre for Biodiversity Policy and Law" (CEBPOL) in the National Biodiversity Authority (NBA), Chennai was established. This agreement has led to collaborations in other areas such as hazardous waste management as well.
United States of America	Under the India-US Partnership for Land Use Science, a five year partnership for the Sustainable Forests and Climate Adaptation Project, USAID Assistance Agreement was signed in 2010. It aims at reducing emissions from land use through afforestation, conservation and sustainable management of forests and by taking REDD+ actions to scale.	Four landscapes have been selected in India and work is in progress in the states of Karnataka, Madhya Pradesh, Himachal Pradesh and Sikkim. Also, several technical exchange programme activities and studies are underway.

## An Inclusive Approach

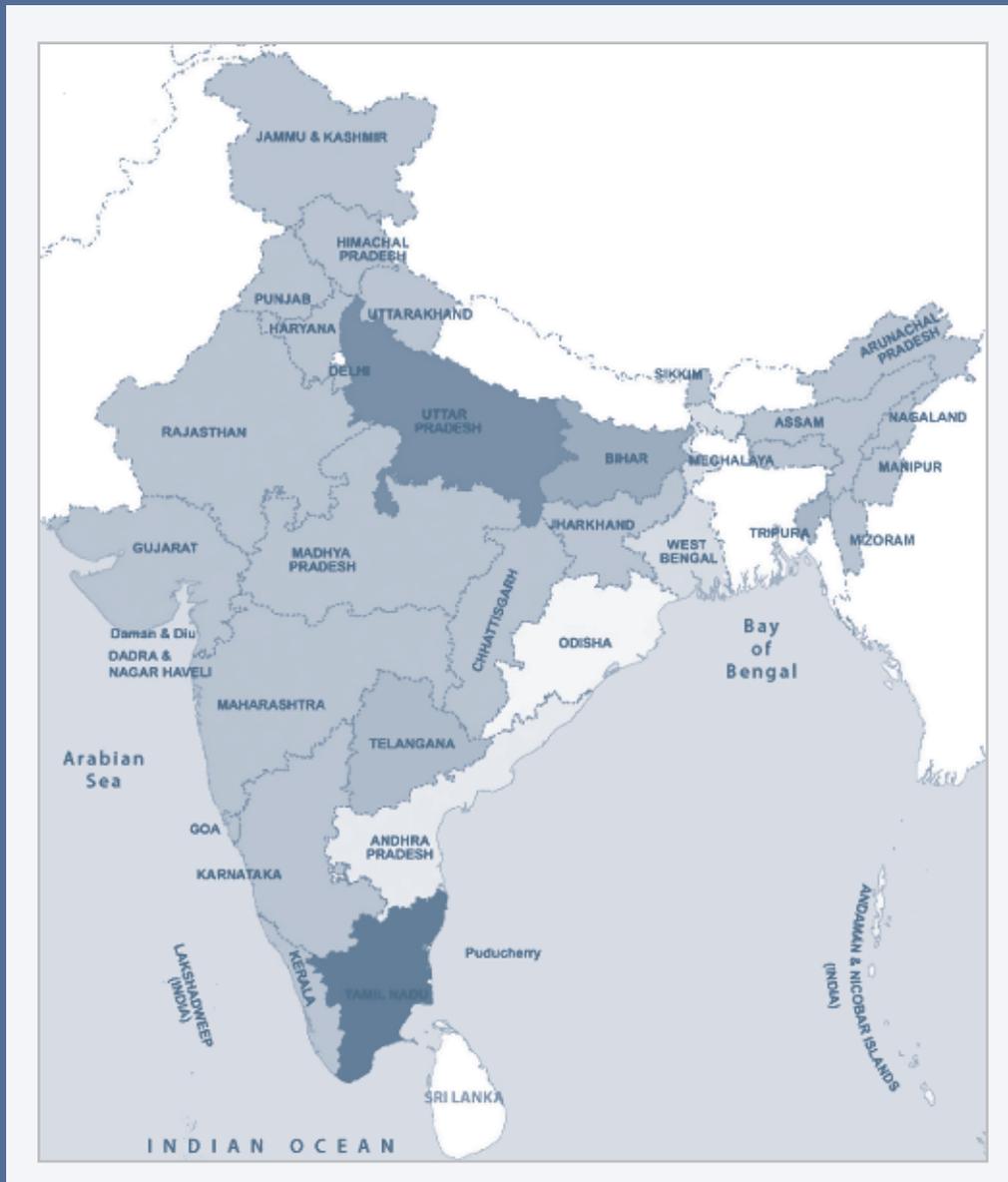
**T**he Government of India recognises the wealth of knowledge and experience that resides within Indian industry, financial institutions and civil society organisations, and most importantly its communities, on the subject of climate change.

India is extremely vulnerable to the impacts of climate change and significant measures are needed to build climate resilience and assist communities with adaptation. Several programmes are already underway in many parts of India, often in partnership with local financial institutions and grassroots non-governmental organisations that are working with local communities on project implementation. Through its corporate social responsibility programmes and other initiatives, Indian industry is also promoting sustainable livelihoods and infrastructure development across the country. Additionally, there are measures that India can take to promote sustainable and inclusive growth in a less carbon-intensive manner. Many of these actions will have to be designed and implemented by industry and civil society organisations.

Recognising the important role that non-state actors must play in shaping India's response to climate change, the Government of India is taking steps to make this an inclusive and consultative process and invites the participation of all communities, non-governmental organisations and industry.

# India's Progress in Combating Climate Change

Briefing Paper for UNFCCC COP 20 Lima, PERU



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