About Vasudha Foundation

Vasudha Foundation was established in 2010 as a non-profit organization with a belief of conserving Vasudha (which in Sanskrit means the Earth), the giver of wealth and sustains all life forms, and with the objective of promoting sustainable consumption of its resources. With this in mind the organization engages in policy advocacy and research activities.

A Handbook of

CLIMATE FINANCE IN INDIA

The Sources of Funding, Usage Patterns, Actual Flows, Estimated Financing Needs And The Politics of Climate Policy Decision Making in India

Lead Author: Srinivas Krishnaswamy

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Abbreviations

ADB	Asian Development Bank
AF	Adaptation Fund
AFD	Agence Française de Développement
BAP	Bali Action Plan
BEE	Bureau of Energy Efficiency
BMU	Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit
CCFU	Climate Change Finance Unit
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CERC	Central Electricity Regulatory Commission
CFL	*compact fluorescent light*
CIDA	Canadian International Development Agency
CIF	Climate Investment Fund
CO^2	carbon dioxide
CO2e	equivalent carbon dioxide
COP	Conference of Parties
CPI	Climate Policy Initiative
DFID	Department for International Development
DGP	Development Grants Program
EC	European Commission
ESCert	Energy Saving Certificate
EU	European Union

FREM	Flood and Riverbank Erosion Risk Management
FSF	Fast Start Finance
FY	Financial Year
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	greenhouse gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GoI	Government of India
GW	gigawatt
HFC	hydroflurocarbons
HLAG	High Level Advisory Group
IDRC	International Development Research Center
IEX	Indian Energy Exchange
IFAD	International Fund for Agricultural Development
IFC	International Finance Corporation
IPCC	Intergovernmental Panel on Climate Change
IREDA	Indian Renewable Energy Development Agency
km²	square kilometer
LDC	Least Developed Country
LDCF	Least Developed Countries Fund
LED	light-emitting diode
MoEF	Ministry of Environment and Forests
MNRE	Ministry of New and Renewable Energy
MRV	Measuring, Reporting, and Verification
MSME	Micro, Small and Medium Enterprise
MW	megawatt
MWh	megawatt-hour
NAMA	Nationally Appropriate Mitigation Action
NAP	National Adaptation Plan
NAPA	National Adaptation Program of Action
NAPCC	National Action Plan on Climate Change

NCEF	National Clean Energy Fund
NORAD	Norwegian Assistance Agency for Development Cooperation
NTPC	National Thermal Power Corporation
ODA	Overseas Development Assistance
PACE-D	Partnership to Advance Clean Energy-Deployment
PACE-R	Partnership to Advance Clean Energy- Research
PACS	Poorest Area Civil Society
PAT	Perform Achieve and Trade
PXIL	Power Exchange of India Limited
REC	Renewable Energy Certificate
REDD+	Reducing emissions from deforestation and forest degradation
RPO	Renewable Purchase Obligation
SAPCC	State Action Plan on Climate Change
SCCF	Special Climate Change Fund
SDC	Swiss Agency for Development and Cooperation
SDG	Sustainable development Goal
SERC	State Electricity Regulatory Commissions
SGP	Small Grants Programme
SIDA	Swedish International Development Agency
SIDBI	Small Industries Development Bank of India
SME	small and medium enterprises
UNIDO	United Nations Industrial Development Organization
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
WRI	World Resources Institute

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1.

Why this Handbook?

One of the most critical issues that needs to be addressed in an "Equitable Framework to Address Climate Change" is with regard to "Climate Finance" as a crucial means of implementation. This has prime relevance not only in the context of a Global Climate Framework to be agreed by 2015, which is currently being negotiated in the United Nations Framework Convention for Climate Change (UNFCCC), but also in the context of the ongoing negotiations on a post-2015 framework with Sustainable Development Goals (SDGs).

A significant step towards creating a fund to address climate change as a global effort was achieved at the 17th Conference of Parties (COP) of the UNFCCC held in 2011 at Cancun (Mexico), through the launch of the Green Climate Fund (GCF)'.

One of the key objectives of the fund is to promote, and enable countries to make a paradigm shift towards low-emission, climate resilient and gender sensitive development pathways by providing adequate resources to meet the full and incremental costs of such pathways. The fund is also mandated to ensure that there are new, additional, adequate and predictable finance resources made available to developing countries by finding innovative financing solutions. Additionally, it also aims at finding ways and means to raise the funds through a combination of public and private financing options.

The GCF has met seven times since its 24-member board was constituted and is working towards full operationalization by early 2015. A key decision that was taken by the GCF board, in line with the Durban meeting outcome, is that any funding approach that the GCF adopts will have to be a country driven process, with priorities for funding being in line with country owned priorities as articulated in national climate change and development plans, including Nationally Appropriate Mitigation Actions (NAMAs) and National Adaptation Plans (NAPs). While this focus on country-ownership is a step in the right direction, it also puts the onus on individual countries to commit to comprehensive multi-stakeholder processes as a critical mechanism that determines the national priorities for climate financing.

Although international attention is focused on the GCF as a future key multilateral fund, the existing global climate finance architecture is already composed of several climate funds and instruments, along with a number of bilateral and multilateral programs aimed at addressing climate change. It also needs to be pointed out that India happens to be one of the largest beneficiaries of some of these programs, projects and funds, especially for mitigation finance.

Policy formulation on climate finance in India is primarily under the purview of the Ministry of Environment and Forests (MoEF), with some role being played by the Ministry of Finance, which has a dedicated Climate Change Finance Unit (CCFU). The Ministry of External Affairs plays a role in the actual negotiations of issues under the UNFCCC.

While there are a number of civil society groups within India that follow the climate negotiations, there are very few that follow climate finance or proceedings of the GCF consistently and with a focus on technical input and specialized advocacy. This can be explained by the limited capacities of the civil society groups in understanding the various complex issues around climate finance. This capacity dilemma is a problem, as civil society groups play a crucial role in holding countries to account for constructive and proactive engagement on climate finance. Within the ongoing operationalization of the GCF, such engagement is important particularly to ensure that funding structures are created that will ensure that allocations are made for the most appropriate projects. As financial inputs to the GCF are discussed, it is also important that countries consider innovative forms of financing the GCF over and above core public finance contributions that the developed countries are expected to make towards the GCF.

Against this backdrop, this handbook has been designed as a guide for civil society groups, and other stakeholders in India to understand the various issues around climate finance needs and flows, specific to the Indian context. Such knowledge and background information is essential to fulfil the potential of Indian civil society groups to meaningfully engage in the process. This handbook seeks to analyze the current institutional and governance structure for climate finance in India. Additionally, it also seeks to assess the actual flows of finance received for addressing mitigation and adaptation in India, against climate finance needs identified by the central and state governments.

In our belief, this handbook will provide much-needed information to civil society groups to play a more active role in the arena of climate finance, particularly,

a) To ensure that, in a country driven process, climate financing will be prioritized for projects that clearly promote sustainable development, and place the country on a pathway which is low-carbon, climate resilient and gender sensitive;
b) To build capacities of various civil society groups to eventually monitor the implementation of climate finance projects/programs in India, specifically those funded by the GCF; and
c) In influencing the various bilateral and multilateral initiatives on climate change in India to truly contribute to the overall objective of promoting low emission, climate resilient and gender sensitive development.

Methodology

A multi-pronged approach consisting of both primary and secondary research was adopted for developing this handbook. Our strategy for this mapping exercise included one-on-one interviews with various stakeholders to understand their perspective on issues related to climate finance policy in India.

To arrive at the climate financing needs (total amount of finance required), and sources of actual financing received in India, we followed a combination of desk research and in-person meetings with personnel from key agencies, departments and ministries, along with representatives of various multilateral and bilateral agencies supporting climate related initiatives in India. We also approached state government officials, and key agencies involved in the preparation of the State Action Plans on Climate Change (SAPCCs). It should be noted that the climate finance flows analyzed in this report consist of public finance only. Private finance has not been covered due to limited availability of information.

For the purpose of this mapping, representatives of the following multilateral and bilateral agencies (currently active in India with climate-related projects and programs) were interviewed for gathering information on climate finance:

1. United States Agency for International Development (USAID)
2. Department for International Development (DFID) and British High Commission
3. Swiss Agency for Development and Cooperation (SDC)

4. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
5. Kreditanstalt für Wiederaufbau, KfW (Germany)
6. The World Bank
7. Asian Development Bank (ADB)
8. United Nations Development Programme (UNDP)
9. Global Environment Facility (GEF)
10. Swedish International Development Agency (SIDA)
11. Norwegian Assistance Agency for Development Cooperation (NORAD)
12. Australian-Aid (Government of Australia)
13. European Commission (EC)
14. International Development Research Center (IDRC, Canada)
15. Clean Development Mechanism (CDM)
16. International Finance Corporation (IFC)

In mapping financial flows from bilateral and multilateral sources towards climate change adaptation and mitigation, we only assessed projects that were specifically focused on addressing climate change. This, of course, may not give the complete picture of actual financial flows from international sources which contribute to addressing climate change. There are many projects with a primary focus on issues such as livelihoods or poverty alleviation but which may also have project components and finance allocations that could help communities adapt to climate change. In the past years, many traditional development agencies have made increasing efforts to mainstream climate change considerations into their development projects, in effect attempting to "climate-proof" their development investments. And, of course, particularly in the area of adaptation and resilience building, the differentiation between classical development spending and expenses toward adaptation is more fluid. However, for the purpose of this analysis, since the exact financial allocation for such climate-relevant components of a development program are not available or calculated, it cannot be accounted for in this handbook. Instead, the focus is on dedicated climate finance expenditures in India.

One example of such possible omission is with the case of the Poorest Area Civil Society (PACS) program of the DFID, UK. PACS is a classic development program focused on livelihoods and poverty alleviation. However, a component aiming to enhance the adaptive capacities of communities to climate change was recently introduced into the program.

2.

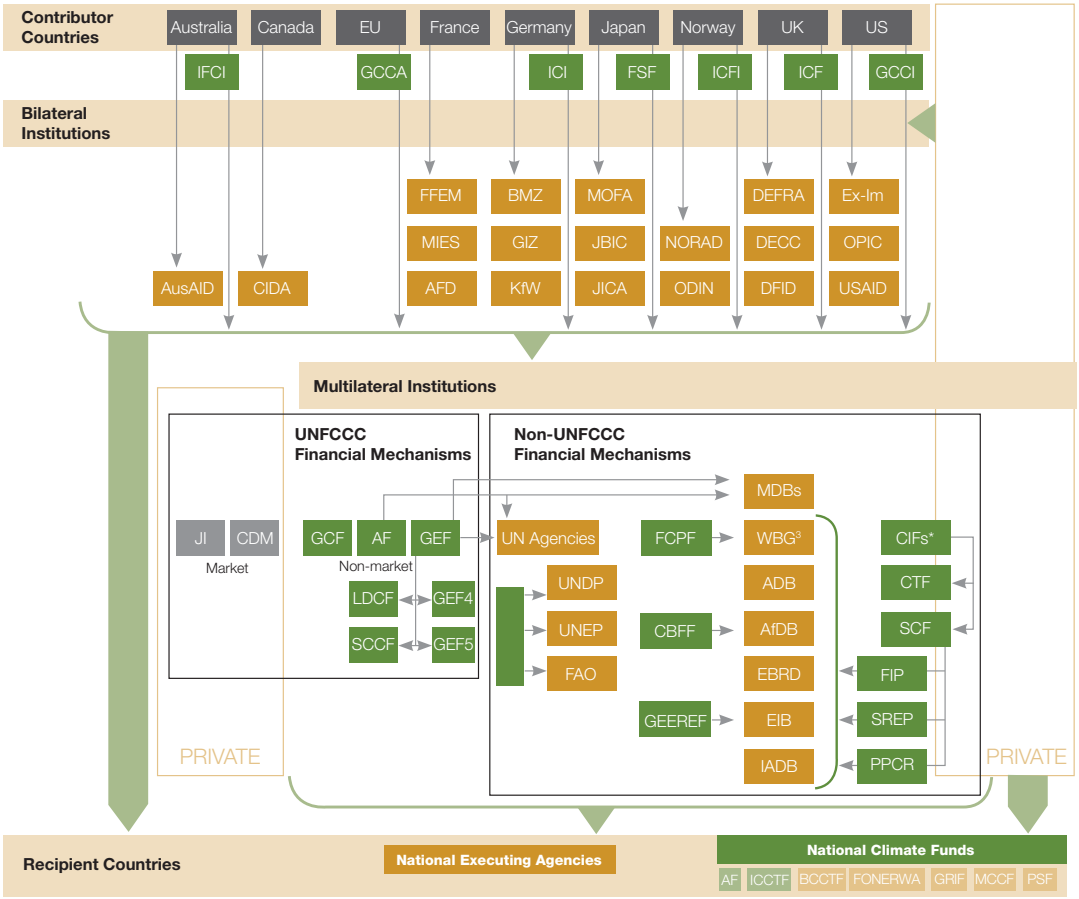
Global Overview of Climate Finance

Globally, there is no precise definition of climate finance; however, simply put, climate finance can be understood to mean the flow of funds from developed to developing nations to help the latter reduce their emissions and adapt to climate change. Climate finance has been a central element of global climate negotiations. Under the UNFCCC, developed country Parties (listed in the Convention's Annex I) are obligated to spearhead global emission reductions; a subset of developed countries, namely those identified in the Convention's Annex II, also have obligations to provide "new and additional financial resources" to developing countries to help them address climate change. Article 4.3 of the UNFCCC establishes that the developed country Parties listed in the Convention's Annex II shall provide new and additional financial resources to meet the agreed full costs incurred by developing country Parties in complying with their obligations under the Convention. It also states that the developed country Parties shall provide such financial resources, including transfer of technology, needed by the developing country Parties to meet the agreed full incremental costs of implementing climate change measures.

According to the Climate Policy Initiative's (CPI's) report titled Global Landscape of Climate Finance 2013, global climate finance flows for the year 2012 consisted of USD 359 billion.[1] Although these flows indicate an increase over previous years, they fall short of the existing investment needs. Another important aspect to be considered in the climate finance debate is that total climate finance flows should not be confused with the USD 100 billion pledge of developed countries per year by 2020, as stipulated by the Copenhagen Accords of 2009. The developing countries have consistently raised the demand that climate finance has to be new and additional. However, the CPI numbers include not just public finance transfers from developed to developing countries, but also developing country domestic resources and private finance flows as well. Indeed, most of the finance in the total figure of USD 359 billion is not necessarily new and additional money flowing from developed to developing countries. To an overwhelming extent, it consists of private sector investments and not public climate finance support as obligated under the UNFCCC. An

[1] "Global Landscape of Climate Finance 2013' Climate Policy Initiative." Accessed December 5, 2013. http://climatepolicyinitiative.org/publication/global-landscape-of-climate-finance-2013/.

Figure 1: Landscape of global climate finance[2].



** The CIFs are administered by the World Bank*
Note: The schematic is indicative and does not capture all climate finance funds and initiatives

additional imbalance of these financial flows is that, of the USD 359 billion flows in 2012, USD 337 billion (approximately 94 percent) flowed to support climate change mitigation, whereas only USD 22 billion (approximately 6 percent) supported adaptation. Practically all of this adaptation support was in the form of public finance, highlighting the importance of public support for adaptation. Developed countries have committed to a balanced allocation between adaptation and mitigation as part of the Copenhagen Accords and the Cancun Agreements. However, the gap in international public finance for adaptation can be gauged from the fact that, during the Fast Start Finance period (2010-12), developed countries contributed around USD 6 billion, which was approximately 21 percent of the total volume of finance.[4] Similarly, funding by bilateral funding institutions over the 2008-09 period had a 70/30 split in favor of mitigation.[5]

[2] "The Global Climate Finance Architecture-Climate Funds Update." http://www.odi.org.uk/sites/odi.org.uk/files/odi-assets/publications-opinion-files/8685.pdf
[3] Agencies of the World Bank Group - International Bank for Reconstruction and Development (IBRD), International Development Association (IDA), International Finance Corporation (IFC), Multilateral Investment Guarantee Agency (MIGA).
[4] 'Adaptation and the $ 100 billion commitment', Oxfam, November 2013 http://www.oxfam.org/sites/www.oxfam.org/files/ib-adaptation-public-finance-climate-adaptation-181113-en_0.pdf
[5] 'Bilateral Finance Institutions and Climate Change: A Mapping of 2009 Climate Financial Flows to Developing Countries', United Nations Environment Program (UNEP), 2010 http://www.unep.org/pdf/dtie/BilateralFinanceInstitutionsCC.pdf

Several funds supporting climate change mitigation and adaptation already exist under the UNFCCC's financial mechanism and the Kyoto Protocol. These are:

Global Environment Facility (GEF) - The GEF is an operating entity of UNFCCC's financial mechanism. As an independently operating financial organization, the GEF provides grants for projects related to biodiversity, climate change, international waters, land degradation, the ozone layer, and persistent organic pollutants. Since 1991, GEF has achieved a strong track record with developing countries and countries with economies in transition, providing USD 11.5 billion in grants and leveraging USD 57 billion in co-financing for over 3,215 projects in over 165 countries. Through its Small Grants Programme (SGP), the GEF has also made more than 16,030 small grants directly to civil society and community-based organizations, totaling USD 653.2 million.[6]

The GEF also serves as a financial mechanism for the Convention on Biological Diversity, UN Convention to Combat Desertification, and Stockholm Convention on Persistent Organic Pollutants. There are some specific funds under the GEF which cater to climate change financial needs. These are:

a. **Special Climate Change Fund (SCCF) -** SCCF was established under the Convention in 2001 to finance projects relating to: adaptation; technology transfer and capacity building; energy, transport, industry, agriculture, forestry, waste management; and economic diversification. This fund complements other funding mechanisms for the implementation of the UNFCCC objectives: and
b. **Least Developed Countries Fund (LDCF) -** LDCF was made operational in 2002, and aims to address the needs of the 49 Least Developed Countries (LDCs) which are particularly vulnerable to the adverse impacts of climate change. As a priority, the LDCF supports the preparation and the implementation of the National Adaptation Programs of Action (NAPAs), which are country-driven strategies that identify the immediate needs of LDCs in order to adapt to climate change.

Adaptation Fund (AF) - AF was established in 2001 to finance concrete adaptation projects and programs in developing country Parties to the Kyoto Protocol that are particularly vulnerable to the adverse effects of climate change. This Fund is financed by voluntary contributions from developed country Parties as well as from a share of proceeds from the CDM project activities and other sources of funding. The share of these proceeds amounts to 2 percent of certified emission reductions (CERs) issued for a CDM project activity.

In 2007, a review entitled *Report on the analysis of existing and potential investment and financial flows relevant to the development of an effective and appropriate international response to climate change* conducted by the UNFCCC's secretariat of , found that the existing climate funds and funding mechanisms under the UNFCCC and the Kyoto Protocol were insufficient.[7]

[6] "What Is the GEF | Global Environment Facility." http://www.thegef.org/gef/whatisgef.
[7] "Fact Sheet: Financing Responses to Climate Change." http://unfccc.int/press/fact_sheets/items/4982.php.

Over the years, several other dedicated climate funds and financing instruments have emerged outside the UNFCCC regime. Some are:

- Australia's International Forest Carbon Initiative;
- The World Bank's portfolio of Climate Investment Funds consisting of:
  1. Clean Technology Fund
  2. Forest Investment Program
  3. Pilot Program on Climate Resilience
  4. Scaling Up Renewable Energy Program;
- Congo Basin Forest Fund;
- Forest Carbon Partnership Facility;
- Norway's International Climate and Forest Initiative;
- Germany's International Climate Initiative; and
- United Kingdom's International Climate Fund.

The existing sources and governance of climate finance have been widely debated since the 2009 climate change summit in Copenhagen, wherein industrialized countries committed to giving USD 100 billion a year in additional climate finance from 2020 onwards. To get things going, immediate 'Fast-Start' Finance (FSF) of up to USD 30 billion was promised under the Cancun Agreements, beginning in 2010 until the end of 2012.[8]

Developed countries have pledged over USD 33 billion in FSF during this three-year period, exceeding the pledges made at Copenhagen in 2009. According to an analysis of the FSF period by the World Resources Institute (WRI), developed countries have increased their expenditure relative to the pre-2010 period. The United Kingdom increased its climate finance four-fold relative to environment-related spending before the FSF period. Germany nearly doubled its climate-related finance. Japan previously mobilized USD 2 billion per year in climate finance through the Cool Earth Partnership; under FSF, it reported an average spending of more than USD 5 billion per year. Finally, through its Global Climate Change Initiative, the United States increased core climate funding from USD 316 million in Financial Year (FY)09 to an average of USD 886 million per year in FY-10 to FY-12.[9] However, questions were raised on how much of the contributed amounts were new and additional rather than repurposed or relabeled, for example, from traditional development expenditures.

The discussion on climate finance moved in a new direction at the 16th COP held in 2010 at Cancun, Mexico, with the establishment of the GCF. The GCF, which is currently still under operationalization, is like the GEF, an operating entity of the financial mechanisms of the UNFCCC. The GCF, with its headquarters in Songdo, South Korea, is intended to be a key source of channeling new, additional, adequate, and predictable financial resources to developing countries.

[8] Institute, Grantham Research. "What Is Climate Finance and Where Will It Come From?" The Guardian, April 4, 2013. http://www.theguardian.com/environment/2013/apr/04/climate-change-renewableenergy.
[9] "Summary of Developed Country 'Fast-Start' Climate Finance Pledges | World Resources Institute." http://www.wri.org/publication/summary-developed-country-%E2%80%98fast-start%E2%80%99-climate-finance-pledges.

It also seeks to catalyze climate finance, both public and private, at both international and national levels. It will pursue a country-driven approach, and promote and strengthen engagement at the country level through effective involvement of relevant institutions and stakeholders. Additionally, the fund also seeks to maintain a balance between funding for mitigation and adaptation, while promoting environmental, social, economic, and development co-benefits, and taking a gender-sensitive approach. Expected to be fully operationalized by early 2015, the GCF is supposed to become a significant source of multilateral adaptation finance and the most important multilateral channel for the fulfillment of the pledge of developed countries in Copenhagen to provide US$ 100 billion, annually, by 2020 to developing countries. Initial resource mobilization for the GCF is scheduled to start in Fall 2014; so far, the GCF has only received very limited funding to support developing countries in preparatory and readiness work to engage with the GCF in the future.

Despite the existence of these climate finance mechanisms, little progress has been made on certain crucial aspects of the financing debate such as on 'new and additional sources.' The global climate finance architecture continues to be dominated by bilateral aid agencies and international development institutions, such as the World Bank through its Climate Investment Funds (CIFs). In order to find the best sources of climate finance, a High Level Advisory Group (HLAG) was constituted in 2010 by the UN Secretary General Ban Ki-Moon. The findings of the group concluded that a combination of sources, including aid-style government pledges, market levies and possible new sources, such as taxes on international aviation and shipping, were needed. A large share of income would also have to come from the private sector through mechanisms such as carbon trading.

3.

Structure of Climate Finance in India

3.1 Overview of Climate Policy in India

India has undertaken several initiatives domestically towards climate change adaptation and mitigation, though most are not necessarily under the umbrella of climate change actions. Policy making around climate change is mainly driven by the pursuit of development goals. Even though various studies have shown that India faces a high risk from the impacts of climate change, the government is focused upon addressing issues such as improving energy security, greater energy access, and reducing expensive energy imports. Concerns surrounding energy have compelled the government to look at renewable energy, and policies and actions stemming from such concerns have resulted in addressing the challenges of climate change as a co-benefit. However, at the same time, the government continues to favor conventional sources of power generation.

Most national policies pertaining to climate change have been developed recently, keeping India's energy needs in mind. Prominent examples of such recent initiatives are the Jawaharlal Nehru National Solar Mission and the National Mission on Enhanced Energy Efficiency being implemented as part of the National Action Plan on Climate Change (NAPCC).

At the international level, India has voluntarily committed to reducing the emissions intensity of its economy by 20 to 25 percent by 2020 as part of the Cancun Pledge made in 2010.

3.2 India's Position at the Climate Negotiations

India's negotiating position is often crafted by the environment and external affairs ministries, and it promotes the primacy of public funds over private for helping developing countries tackle climate change. The Indian position has always put the responsibility of bringing down emissions to acceptable levels on the industrialized countries. Further, India opposes the plan to reduce emissions in the period up to 2020 through international initiatives focused on black carbon, agricultural methane, energy efficiency, and refrigerants such as hydroflurocarbons (HFCs).

While, in the UNFCCC negotiations, India has always maintained that it would not seek any funding for adaptation-related activities for itself. It, nevertheless, has been a strong supporter for developing countries' demands for making more public finance available for adaptation-related activities for developing and, especially, least developed countries.

India is also vocal in demanding that industrialized countries should come to the UNFCCC negotiations with a plan and a pathway, and pledge new and additional finance to meet the agreed USD 100 billion per year target by 2020. In one of its submissions to the UNFCCC, India stated that, in the context of the Durban Platform negotiations, developing countries "could enhance their mitigation actions, depending upon provision of finance, technology and capacity building support by developed countries Parties."[10]

3.3 Impact of Climate Change in India and an Assessment of Financial Needs

As Mr. Jairam Ramesh, the former Minister for Environment and Forests, wrote in the preface to a report titled ***Climate Change and India: A 4x4 Assessment,***[11] presented by MoEF,

"As I have said in the past, ***no country in the world is as vulnerable, on so many dimensions, to climate change as India****. Whether it is our long coastline of 7,000 kms, our Himalayas with their vast glaciers, our almost 70 million hectares of forests (which incidentally house almost all of our key mineral reserves) – we are exposed to climate change on multiple fronts. Rigorous science based assessments are therefore critical in designing our adaptation strategies."*

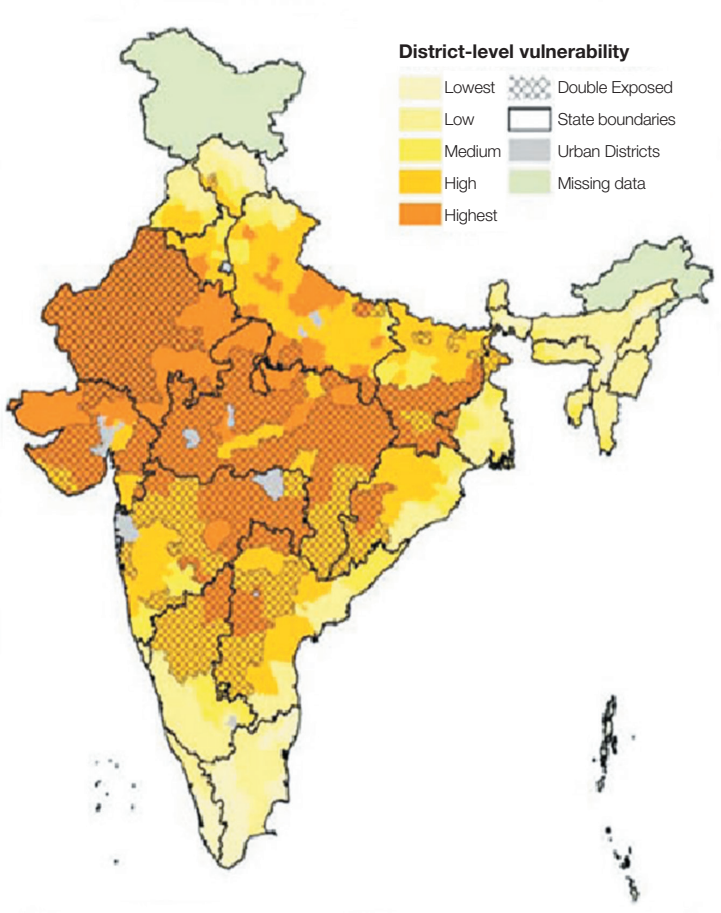
The former minister's statement expresses a perception, shared by many Indians including policy makers, that India has reasons to be concerned about climate change. Its large population depends upon climate-sensitive sectors such as agriculture and forestry for their livelihoods. Any adverse impact on water availability due to recession of glaciers, decrease in rainfall and increased flooding in certain pockets will threaten food security, cause dieback of natural ecosystems including species that sustain the livelihood of rural households, and adversely impact the coastal system due to sea-level rise and increased extreme events. In addition, climate change impacts threaten the achievement of vital national development goals related to other systems such as habitats, health, energy demand, and infrastructure investments.

In the Working Group-2 component of the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) in 2009, most of India's peninsular regions are considered to be highly vulnerable to climate change. In a map that was released with the study,[12] on a scale of 5, from the lowest to highest, the map shows the vulnerability of various districts of the country

[10] Government of India submission on the Durban Platform for Enhanced Action, February 28, 2012, https://unfccc.int/files/documentation/submissions_from_parties/adp/application/pdf/adp_india_28022012.pdf
[11] Source: http://moef.nic.in/downloads/public-information/fin-rpt-incca.pdf
[12] Assessment of adaptation practices, options, constraints and capacity. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Source: http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-chapter17.pdf

to climate change, and, in fact, some districts face a higher risk of climate change impacts in comparison to other districts. The map is shown in Figure 2.

Figure 2: Vulnerability map of India



As a developing country, India faces a number of development challenges. One of the key challenges is to lift close to 37 percent of its population out of absolute poverty; this large population segment also has extremely low adaptation capabilities.[13] The second important challenge for India is to ensure that every Indian has access to good quality infrastructure. The challenges imposed by climate change exacerbate difficulties in the realization of these development mandates. At the same time, India has to deal with climate change and its impacts on a war footing and move towards climate proofing its development efforts.

[13] http://planningcommission.nic.in/data/datatable/1612/table_95.pdf

To address some of its adaptation challenges, the Government of India (GoI) spent (through public funds) an estimated 2.6 percent of its Gross Domestic Product (GDP)[14] in 2009-10, which is roughly equivalent to USD 2,348 million. However, this is far less than the amount needed for carrying out meaningful adaptation measures. In addition, not all this amount is exclusively for adaptation; it is also spent on development programs that have an adaptation co-benefit. Finally, these numbers are for actual expenditures and do not include those projected under various activities envisaged under the NAPCC for that year, many of which remain unimplemented because of a paucity of funds.

While there are no exact figures of the financial requirements to meet the adaptation and mitigation needs of India, the Planning Commission of India has estimated the total costs of implementing the NAPCC at INR 2,300 billion or approximately USD 37.16 billion. The estimated costs are for all programs and activities envisaged in each of the eight identified missions. In view of this huge funding requirement, yet another big challenge for the country is to leverage additional domestic resources of finance to address climate change adaptation and mitigation requirements.

Table 1 gives an overview of the financial requirements as estimated by the Planning Commission.

Table 1: Implementing agencies and financial outlays of the NAPCC[15]

S. No.	National Mission and Nodal Agency	Features of the mission	Financial Outlay for the mission
1.	**Mission:** Jawahar Lal Nehru National Solar Mission **Nodal Agency:** Ministry of New and Renewable Energy (MNRE)	Launched on January 11, 2010, the mission aims at increasing the share of solar energy in India's energy mix. The mission seeks a capacity addition of 20 gigawatt (GW) of grid-connected solar energy by the end of the 13th Five Year Plan in 2022. The mission also has a research and development program which addresses challenges in promoting solar energy in India	The mission is being implemented in three phases, with the financial outlay for the first phase being INR 4,337 crore. Financial requirements for the second phase will be assessed after implementation of the first phase has been reviewed
2.	**Mission:** National Mission for Enhanced Energy Efficiency **Nodal Agency:** Ministry of Power/Bureau of Energy Efficiency	Under implementation from April 2010, the mission seeks to enhance efforts at creating a market for energy efficiency. It seeks the development of a policy and regulatory environment that will promote the adoption of energy efficient measures. The mission expects that, by about 2015, about 23 million tons of oil-equivalent of fuel savings – in coal, gas, and petroleum products – will be achieved every year along with an expected avoided capacity addition of over 19 GW	The total requirement projected under the Mission between 2010-12 is INR 425.35 crore

[14] Source: Climate Change Finance Unit, Ministry of Finance, Government of India.
[15] Report of the Sub-Group on Climate Change, Planning Commission, Government of India.

S. No.	National Mission and Nodal Agency	Features of the mission	Financial Outlay for the mission
3.	**Mission:** National Mission on Sustainable Habitat **Nodal Agency:** Ministry of Urban Development and Ministry of Housing and Urban Poverty Alleviation	The mission promotes energy efficiency in buildings, management of solid waste and modal shift to public transport options based on bio-diesel and hydrogen	The total cost estimate projected in the Mission Document is INR 1,000 crore. During the 11th Plan, expenditure of INR 50 crore was incurred and remaining INR 950 crores is to be incurred during the 12th Five Year Plan
4.	**Mission:** National Water Mission **Nodal Agency:** Ministry of Water Resources	The National Water mission seeks to promote measures such as rainwater harvesting and groundwater recharging, thereby reducing wastage of water and increasing conservation and equitable distribution within and across the states of India	The total estimated additional fund required for implementing the Mission is INR 89,101 crore during the 11th and the 12th Five Year Plan period. This includes expenditure on schemes implemented through the State and the Central Plans
5.	**Mission:** National Mission for Sustaining the Himalayan Ecosystem **Nodal Agency:** Ministry of Science and Technology	This mission seeks to safeguard the Himalayan glacier and mountain ecosystem. Key components of the mission include biodiversity conservation and protection, wildlife conservation and protection, traditional knowledge societies and their livelihood, planning on sustaining the Himalayan ecosystem. It also seeks to study the link between glacier movements and climate change	INR 550 crore has been sanctioned under the 12th plan period for achieving the mission objectives
6.	**Mission:** Green India Mission **Nodal Agency:** MoEF	This mission, through afforestation on degraded forest land, focuses on enhancing ecosystem services and carbon sinks	An estimated expenditure of INR 46,000 crore is projected for the Mission over the next 10 years
7.	**Mission:** National Mission for Sustainable Agriculture **Nodal Agency:** Ministry of Agriculture and Cooperation/ Department of Agricultural Research and Education	The agriculture mission seeks to ensure food security, and protect land, water, biodiversity, and genetic resources for sustainable production of food. Under the mission, strategies will be developed to make Indian agriculture more resilient to climate change, and improve the productivity of rain-fed agriculture	The proposed adaptation and mitigation activities under the Mission require an additional budgetary support of INR 1,08,000 crore at current prices up to the end of the 12th plan
8.	**Mission:** National Mission on Strategic Knowledge on Climate Change **Nodal Agency:** Ministry of Science and Technology	This mission seeks to promote research and technology development for understanding and addressing the various challenges presented by climate change	INR 150 crores is required in the 11th plan period for implementing Mission activities. Provision of INR 2,500 crore is to be made under the 12th plan period

In a recent development, MoEF, GoI mandated every state to prepare a SAPCC, which could be implemented to complement the activities and programs envisaged in the NAPCC. The states were also mandated to prepare detailed budgetary estimates to implement the plans.

Of a total of 29 states in India, 22 have come up with draft SAPCCs. The MoEF has approved the action plans of 14 states as of February 2014. The total cost of implementing SAPCCs of the 14 states amounts to INR 2,009 billion for 2012-17, translating to approximately USD 31 billion. The estimated amount required for adaptation-related activities is INR 1,089 billion, or USD 16.75 billion.

Table 2 gives an overview of the cost estimates of implementing the SAPCCs in 14 states of India which have government-approved climate actions plans.

Table 2: Cost estimates for implementing state climate action plans

State	Geographic Area (in km^2)	Population (in Million)	Adaptation Budget (in INR Million)	Mitigation Budget (in INR Million)	Extra Cost (in INR Million)	Total Budget (in INR Million)
Arunachal Pradesh	83,743	1,382,611	71,591	40,605.4	1,122	113,318.4
Assam	78,438	31,169,272	69,070	29,600	11,540	110,210
Haryana	44,212	25,353,081	107,770	453,259	560.5	561,584.5
Himachal Pradesh	55,673	6,856,509	8,450	2,300	4,850	15,600
Karnataka	191,791	61,130,704	247,380	12,300	-	258,680
Madhya Pradesh	308,245	72,597,565	37,160	8960	415	46,535
Manipur	22,327	2,721,756	23,781.8	15,363.7	-	39,145.5
Meghalaya	22,429	2,964,007	25,568.1	37,403.12	-	62,971.22
Nagaland	16,579	1,980,602	12,987.85	25,052	1225	39,264.85
Odisha	155,707	41,947,358	88,920	81,400	-	170,320
Mizoram	21,081	1,091,014	13,931.47	13,988.76	-	27,920.23
Sikkim	607,688	7,096	303580.6	8350.8	-	311,931.4
Uttarakhand	53,483	10,116,752	18121.183	113,809.57	10	131,940.753
West Bengal	88,752	91,347,736	97920	49,000	-	146,920
Total	1,750,148	350,666,063	1,089,594.603	884,999.55	13,222.5	2,036,341.853
India	3,287,240	1,210,193,422	-	-	-	-

Note: km^2 = square kilometer.

In short, the total requirement of financial resources to meet activities under the NAPCC and SAPCCs for 14 states is estimated to be USD 66 billion for a period of five years. These costs do not factor in the financial need assessment of the remaining 15 states, plans for which are yet to be developed. As can be seen from Table 2, the states that have submitted their SAPCCs contain approximately 53 percent of the country's geographic area and approximately 29 percent of the total population. It is fairly evident that the costs of implementing these SAPCCs would increase significantly (almost three times) once all 29 states, including the geographically large and populous states such as Punjab, Maharashtra, Rajasthan, and Uttar Pradesh, submit their plans.

3.4 Institutional, Governance, and Policy Structure of Climate Finance in India

In India, climate change is under the purview of MoEF, which is mandated to interact with all other government agencies and departments to mainstream climate change considerations into their respective policies and actions. For matters that require a cabinet decision, the MoEF prepares a brief to the Cabinet or a Group of Ministers, and seeks their approval.

The Planning Commission of India is entrusted with the responsibility of preparing both annual development plans for the country as well as coming up with Five Year Plans, with inputs from the various ministries, departments and agencies and based on inputs from the State Planning Commissions.

Further, for the country as a whole, the guiding document for action on climate change is the NAPCC consisting of eight missions. The ministries responsible for implementing the eight missions have also prepared detailed budgetary estimates required for implementing their respective mission targets (Table 1).

For all practical purposes, the onus of arriving at the total countrywide finance requirement for addressing climate change in India is on the Planning Commission. However, the Planning Commission is not a decision-making body. It can only provide recommendations with the allocations of finance for domestic climate actions being ultimately determined by the Ministry of Finance, which is in charge of preparing budgets in India, including imposing taxes and levies as well as making annual allocations for expenditure by different line ministries at the central and state levels.

While the MoEF is the nodal body in any climate related negotiations at any forum or UN body, the Ministry of External Affairs is also involved in the negotiations. While they may, at times, bring in their different perspectives, the final call on position usually rests with the MoEF. The Planning Commission and the Prime Minister's Office also have an advisory role to play in the institutional decision-making regarding climate change, although there have been instances where the position of the MoEF has prevailed over these two. One such example is with regard to the case of HFC phase out. It is believed that the Prime Minister's Office wanted India to agree to a HFC phase out, based on the promise that the Prime Minister had given to the US President. However, MoEF insisted on its earlier position of rejecting a phase out of HFCs by developing countries.

As far as determining flow of climate finance is concerned, India has a dedicated CCFU, housed in the Ministry of Finance. Its main functions and responsibilities are:

a) To serve as the nodal point on all climate change financing matters;
b) To represent the Ministry of Finance in all climate change financing related issue at all international and domestic forums;
c) To advise MoEF and GoI on its position on climate finance, particularly in the context of the UNFCCC negotiations, and role and functioning of the GCF along with other domestic and international platforms and forums; and

d) To provide Indian negotiators in the context of the UNFCCC negotiations with briefs based on analysis of various country submissions to the UNFCCC, which is specific to climate finance, and to also analyze various pledges by developed countries.

3.5 Mapping of Various Stakeholders and their Role in Climate Finance in India

In addition to these state actors, there are a number of non-state actors, as well as representatives from foreign countries and multilateral agencies, who are involved in the climate policy space. The non-state actors are primarily civil society groups, research and academia, think tanks and policy analysts. In addition, there are bilateral and multilateral donor agencies that also operate in this space. Further, there are representatives of the environment and business development cells of various country embassies, missions and high commissions based in India.

From a climate angle, representatives of the environment/climate cell are primarily interested in gauging India's stance on climate negotiations, to inform their respective countries' negotiating stance particularly on climate.

However, on climate finance per se, the interest of representatives of the environment and business development cells of various country embassies, missions and high commissions based in India, is primarily to assess and monitor the Overseas Development Aid (ODA) flows from their respective countries to India and also to identify possible projects or areas for bilateral cooperation. They also assess the potential for various projects in India from a business development perspective, particularly for projects in the so-called "clean energy" and "sustainable transport" space and to enhance industry-to-industry cooperation and facilitate trade in the areas.

As of now, there are very few civil society groups, research/academic groups, policy analysts and think tanks that are exclusively engaged in the climate finance space. A number of groups have provided inputs to and critiqued the NAPCC and SAPCCs and, in some cases, helped in estimating the budgetary requirements for implementing SAPCCs. However, there is very little involvement of these groups in monitoring international negotiations around climate finance and actual climate finance flows received by India. Further, there is also very little involvement of these groups in climate finance advocacy with Indian negotiators and policy makers to suggest new and innovative methods for raising climate finance and to identify new areas for directing these flows.

Acknowledging the vital role that civil society plays in climate finance discourses, both on the international and national levels, recently, the Ministry of Finance and CCFU have made it a point to invite civil society inputs prior to the GCF Board Meetings. Inputs are sought particularly on key operational modalities related to its business model framework, a proposed private sector facility and on efforts for resource mobilization for the fund, some of the key issues under discussion in the GCF. However, interest and participation from Indian civil society and other stakeholder groups have, so far, been limited, primarily because of lack of awareness and capacities amongst groups potentially willing to follow the issue.

As of April 2014, only six Indian civil society groups are accredited to the GCF, namely, the Keystone Foundation, Applied Environmental Research Foundation, Centre for Policy Research, Vasudha Foundation, Centre for Community Economics and Development Consultants Society, and Climate Action Network South Asia.

As for private sector actors, till April 2014, SELCO Solar Private Limited, a social entrepreneur organization working in the field of promoting solar systems, and Core CarbonX Solutions, are two private sector entities from India accredited to the GCF.

In terms of other stakeholders, one group that has not played a very active role in either influencing India's position at the UNFCCC or on specific issues, inclusive of climate finance, is the country's parliamentarians and state legislators. This group together forms a very important constituency from a state policy makers' perspective, as many SAPCCs exist only on paper with no implementation road map as yet, which is primarily due to the lack of available financing.

The parliamentarians only get a feedback as annual reporting after the Convention/Meeting of Parties, and, most often, very little space or discussion time is allocated on the floor of the Parliament on this issue. While there are dedicated groups working with parliamentarians such as the Climate Parliament, The Globe, Centre for Legislative Research and Advocacy and PRS Legislative Research, their focus on international negotiations and crucial issues of climate finance is close to nil.

Some key observations from the findings of this mapping are:

a) There is immense scope for other players within the government to be involved in the discussion around climate finance, particularly ministries that are active in implementing a number of plans and programs that have immense potential for reducing carbon emissions. They include MNRE, Ministry of Power, Ministry of Urban Development, Ministry of Surface Transport and Ministry of Agriculture, to name a few. All are currently, at best, peripherally engaged in the implementation of national climate change initiatives;
b) These ministries need to be involved not just in the process of finance requirement analysis but, primarily, also in preparing key national climate strategy framework documents such as the NAMAs, and a NAP. They should also play a role in national and state-wide debates on identifying financial instruments, such as emissions trading instruments, similar to the Perform Achieve and Trade (PAT) scheme for energy efficiency measures in industries, the possibility of carbon taxes, increases in tax slabs for vehicles of an engine and body size above a specified level, or a cess on coal, amongst others. In general, there is a need to ensure that climate change is mainstreamed into the activities of all relevant ministries, rather than letting MoEF and a few other ministries and departments decide on policies, programs and specific initiatives to deal with the issues; and
c) There are very few non-state actors in India following the issue of climate finance and, therefore, there is very little input to the government on climate finance policy formulation. There is also limited monitoring of government actions and commitment and, thus, few efforts to hold the government accountable. There is a very vibrant civil society movement that engages on various aspects of development policy in India. Many of the progressive initiatives in the past decade on development have been initiated and campaigned for by the civil society movement. However, most of these civil society groups do not work on climate change. There is, thus, a need to draw them into the climate change policy debate, so that a more vibrant civil society movement can be catalyzed to engage meaningfully with the government on formulating an effective climate change strategy in India.

4.

Domestic Climate Finance Flows

4.1 National Budgetary Flows

As detailed in the earlier section, the estimated actual spending (through domestic public sources) on India's adaptation needs, covering the sectors of health, water, rural development and forestry, was approximately 2.6 percent of its GDP in the year 2009-10.

Further, the budgetary requirements to meet the plans under the NAPCC for a period of five years is estimated to be USD 31 billion.

GoI has always maintained that all its plans, programs, and activities envisaged under the NAPCC would be purely voluntary, not to be understood as meeting of requirements under the UNFCCC. Therefore, these plans are not subject to any financial flows or support from the international community as part of a future climate agreement under the UNFCCC. However, India has often stated at the UNFCCC that it is willing to take on more ambitious mitigation actions, over and above those envisaged in the NAPCC, if there are adequate financial flows from the GCF. Therefore, as of now, all estimated financial requirements for the implementation of the programs envisaged under the NAPCC would have to be met through domestic resources. Some measures that have been undertaken for financing certain aspects of the NAPCC are:

a) **Fiscal Instruments**: Fiscal instruments, in the form of the Partial Risk Guarantee Fund and Venture Capital Fund for Energy Efficiency, are primarily instruments established from seed capital provided by GoI as "viability gap funding" for financial institutions and private entities. These funds are administered by a public sector enterprise, Energy Efficiency Services Limited, a joint venture of the National Thermal Power Corporation (NTPC), Power Finance Corporation, Rural Electrification Corporation, and Power-grid Corporation of India;
b) **Tax Incentives**: Tax incentives are offered in the form of tax holidays for new ventures, exemption from value added tax for capital equipment and accelerated depreciation;

c) **Subsidies**: In addition to tax incentives, subsidies are given for capital investments on select renewable energy applications. These subsidies are geography and device specific. Subsidies also take the form of subsidized/concessional interest rates, to ensure access to low-cost loans to purchase renewable energy products and applications;
d) **Regulatory Measures (Feed-in-Tariffs)**: The feed-in tariff is a policy mechanism designed to accelerate investment in renewable energy technologies. In India, feed-in-tariffs are set at the state level by the state electricity regulatory authority, for various sources of generation of electricity from renewable energy sources. The tariffs are based on the current capital costs, penetration levels and economies of scale, to determine the cost of generation. Feed-in-tariffs are typically revised periodically, some every year and others once in two to three years. The budgetary support for feed-in-tariffs comes from the national budgetary allocations; and
e) **Utility and Municipality Demand-side Management Programs for the Energy Sector**: A number of city municipalities and state-owned electricity distribution companies are provided with budgetary support to run demand-side management programs, aimed at enhancing energy efficiencies. These programs include the village light-emitting diode (LED) program, irrigation pump set efficiency program, compact fluorescent light (CFL) lighting programs, public water pumping system efficiency improvement programs.

4.2 State Budgetary Flows

According to the Constitution of India, states have relatively limited powers for revenue generation. Over the years, the financial autonomy of the states has been eroded due to increased centralization of taxation. As a result, states are highly dependent on transfer of resources from GoI. Therefore, with the limited powers of the state to raise its own revenues, the largest single contributor to the state's exchequer is the sales tax, a tax on sale of products within the boundaries of the state.

Therefore, states have to largely depend on national programs and activities to meet their budgetary requirements, in addition to planned allocation that the states receive from resources committed to the implementation of national five year planning processes.

It must be pointed out here that MoEF encourages the states to prepare the SAPCC. And it also makes an offer that the states complying with the requirements could also submit the plans to the Planning Commission for consideration of allocation of financial resources for the 12th Five Year Plan (2012-17).

4.3 Global and Domestic Direct Market Mechanisms

In addition to direct government budget allocations at the national and state levels, market mechanisms on domestic and global levels generate resources for climate change action in India. Some of the mechanisms operating at the moment are:

A) Domestic mechanisms

(i) PAT scheme

The PAT scheme is a market-based mechanism for enhancing energy efficiency in large-scale and energy-intensive industries. Industries that qualify to participate in this scheme are known as 'Designated Consumers' and a total of 478 facilities have been identified by the Bureau of Energy Efficiency (BEE). The scheme sets energy efficiency targets and incentivizes businesses achieving higher energy efficiency with tradable energy saving certificates (ESCerts). Each ESCert is equivalent to 1 metric ton of oil equivalent. The market for these ESCerts will be those entities that do not meet their energy efficiency targets, and will need to buy these ESCerts to meet the energy efficiency norms.

The nine sectors covered by BEE under the PAT scheme are:

1. Aluminum
2. Fertilizers
3. Iron and steel
4. Cement
5. Pulp and paper
6. Chlor-alkali
7. Railways
8. Thermal power plants
9. Textile

PAT was rolled out in April 2011 and aims to reduce emissions by 26 million tons of equivalent carbon dioxide (CO_2e), as well as save 6.6 million tons of oil equivalent over its first commitment period (2012-15). Covered facilities are generally obligated to improve energy efficiency by 1-2 percent per year.

(ii) Renewable Energy Certificates (RECs)

The REC is again a market-based measure, designed to ensure compliance to Renewable Purchase Obligations (RPOs) set by various State Electricity Regulatory Commissions (SERCs) and encourage states to tap their renewable energy potentials. It also acts as an incentive to state electricity utilities to purchase electricity from renewable energy sources, over and above their stipulated RPOs. It further acts as a disincentive to states that are not able to achieve their RPO commitments.

The rationale behind implementing the REC mechanism was to achieve renewable energy generation goals specified under the Electricity Act, 2003 and NAPCC. Under the Electricity Act, 2003, the country's SERCs set targets for power companies to purchase a certain percentage of their total power from renewable sources. These targets are called RPOs.

Each REC is equivalent to 1 megawatt-hour (MWh) of energy generated from renewable energy sources -- solar, wind, small-scale hydro (capacity below 25 megawatt (MW)), biomass-based power, biofuels, and municipal waste-based power. The purchase of each REC is treated as the consumption of a corresponding quantity of renewable energy. Twenty-one of India's states have REC obligations, ranging from 2 to 14 percent energy purchase from renewable sources.

Starting in April 2011, RECs are submitted and traded at India's two major power exchanges, Indian Energy Exchange (IEX) and Power Exchange of India Limited (PXIL). The floor and ceiling prices of RECs are determined by the Central Electricity Regulatory Commission (CERC) from time to time. The price band for solar certificates is fixed at USD 264-375 per MWh, and for wind certificates this value is USD 33-86 per MWh. According to the Environmental Defense Fund, trade estimates value India's REC market size at USD 1.2 billion.[16]

Till February 2014, India's total REC issuance had reached 10.1 million RECs. Of the total RECs issued till date, 9.9 million are non-solar RECs.[17]

B) Global mechanism

Clean Development Mechanism

The CDM, which is the first global, environmental investment and credit scheme for promoting low carbon solutions, was conceived as a mechanism under the Kyoto Protocol to the UNFCCC. Primarily, the CDM allows emission-reduction projects in developing countries to earn CER credits, each equivalent to 1 ton of carbon dioxide (CO2). These CERs can be traded and sold, and used by industrialized countries to a meet a part of their emission reduction targets under the Kyoto Protocol.

The key objectives of the CDM, as it was conceived, are to contribute towards UNFCCC's ultimate objective by providing financial assistance to developing countries to embrace sustainable and low carbon development pathways. This is done by allowing industrialized countries to achieve compliance with their Kyoto emission reduction commitments to offsetting national emissions with generally less costly emissions reductions efforts in developing countries.

Since the CDM was operationalized in 2006, India has been the second largest beneficiary with a total of 2,850 projects approved by the National CDM Authority as of March 2012. The number of CER units for the period total 722,912,922 metric tons of CO2e.

The World Bank, in its report, titled, State and Trends of the Carbon Market, 2012, estimates that the total revenue through the CERs for the period, for Indian projects alone, would be in the region of INR 343,384 million approximately.[18]

[16] The World's Carbon Markets: A Case Study Guide to Emissions Trading, Environmental Defense Fund http://www.ieta.org/assets/Reports/EmissionsTradingAroundTheWorld/edf_ieta_india_case_study_may_2013.pdf

[17] Source: Climate Connect, http://www.climateconnect.co.uk/Home/?q=India%E2%80%99s%20REC%20issuance%20crosses%2010%20million%20in%20February%20

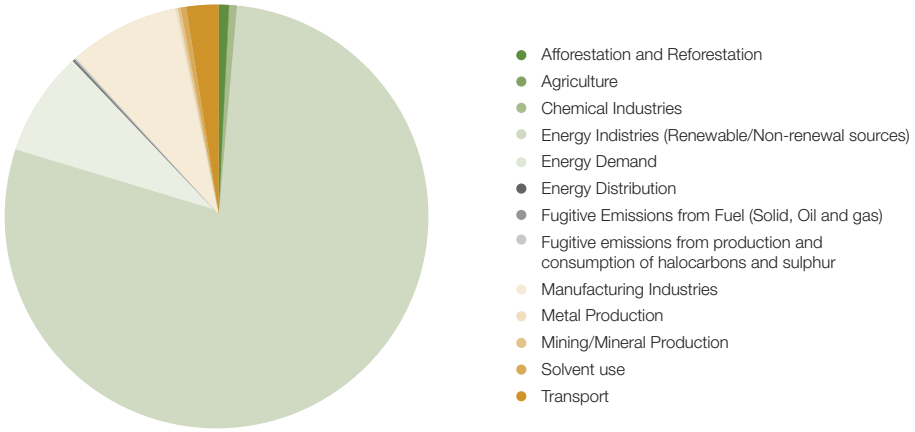
[18] http://siteresources.worldbank.org/INTCARBONFINANCE/Resources/State_and_Trends_2012_Web_Optimized_19035_Cvr&Txt_LR.pdf

Table 3 and Figures 3 and 4 present a broad overview of the profile and sector-wise distribution of the CDM projects.

Table 3: Sector-wise distribution of CDM projects in India

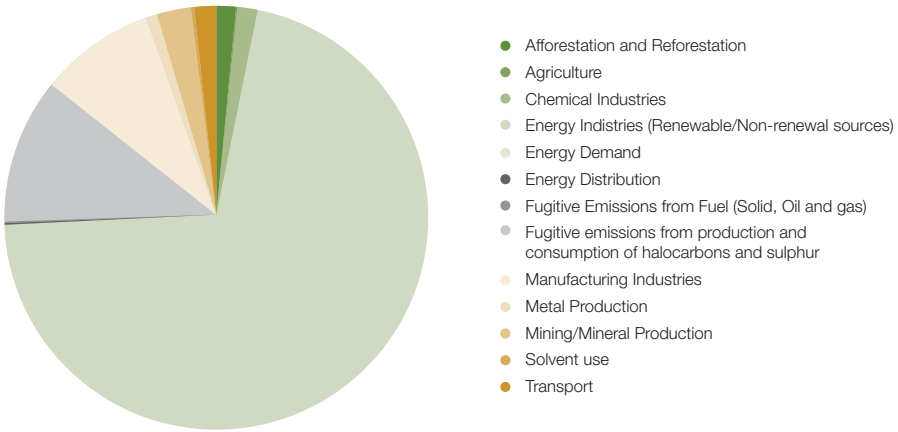
S.No.	Name of Sector	No of Projects	CER up to 2012 (tCO_2e)
1.	Afforestation and Reforestation	18	10,874,541
2.	Agriculture	3	74,393
3.	Chemical Industries	18	11,793,853
4.	Energy Industries (renewable/non-renewable sources)	2241	487,417,048
5.	Energy Demand	222	27,109,485
6.	Energy Distribution	9	657,149
7.	Fugitive emissions from fuel (solid, oil and gas)	3	165,438
8.	Fugitive emissions from production and consumption of halocarbons and sulphur	6	82,095,771
9.	Manufacturing Industries	237	64,405,361
10.	Metal Production	5	5,425,126
11.	Mining/Mineral Production	4	19,053,935
12.	Solvent Use	1	103,579
13.	Transport	13	1,238,906
14.	Waste Handling and Disposal	70	12,498,337
	Total	**2,850**	**722,912,923**

Figure 3: Sector-wise distribution of approved CDM projects in India[19]



As can be seen from Figure 3, of a total of 2,850 CDM projects in India. 2,472 (almost 87 percent) are in the energy sector. These projects are mostly dominated by the renewable energy sector where many power generation projects are being developed to meet the gap in demand and supply of electricity in India.

Figure 4: Sector-wise distribution of CERs generated up to 2012 in India[20]



Projects registered to mitigate emissions from the production and consumption of halocarbons and sulfur are only a handful in India (six in total). However, they have produced 11 percent of the total CERs generated in India till date.

[19] Source: Based on information collected from the National CDM Authority, MoEF, Government of India http://www.cdmindia.gov.in/reports_new.php?n=1
[20] Source: Based on information collected from the National CDM Authority, MoEF, Government of India http://www.cdmindia.gov.in/reports_new.php?n=1

5.

Profile of Finance Flows

5.1 Overview of Bilateral and Multilateral Project Financing in India

India has been a beneficiary of bilateral and multilateral financial flows for many decades now, both in the form of grants, loans, soft loans, and technical and capacity building assistance. These financial flows are project and sector specific. Most grants that India has received are packaged under the banner of ODA and this continues even for climate financing. Those grants that are not under the ODA umbrella are part of a specific joint program, such as the European Union (EU)-India Clean Energy Partnership, and the U.S.-India Clean Energy Partnership, and so on. However, these programs are also treated as ODA.

The total financial flows into India from a combination of grants, loans and technical assistance are valued at approximately USD 10.5 billion since 2007. For the purpose of this mapping, we have looked at bilateral and multilateral projects that have been implemented in India since 2007, and projects that were being announced or implemented at the time of writing the report in 2013. The year 2007 was chosen as the starting point because it saw the adoption of the Bali Action Plan (BAP) under the UNFCCC and one of its pillars was 'enhanced action on the provision of financial resources and investment to support action on mitigation, adaptation, and technology cooperation'. The financial volume of the projects has been taken on the basis of the amount committed for the entire duration of the project. Therefore, if a project began in 2012 and is ending in 2017, we have taken into account the entire amount sanctioned for its duration.

5.1.1 Sources of Foreign Financial Flows

5.1.1.1 Grants:

The key sources of bilateral assistance in the form of grants are:

- USAID
- Canadian International Development Agency (CIDA)
- IDRC, Canada

- DFID and British High Commission
- SDC[21]
- Indo-German Development Cooperation
- GIZ
- SIDA[22]
- NORAD[23]
- Indo-French Development Cooperation[24]
- Australian-Aid (Government of Australia)
- European Commission
- Japan – Green Aid Plan

5.1.1.2 Multilateral Grants:

The key sources of multilateral assistance to India in the form of grants and project support in the recent past are:

- UNDP
- GEF

5.1.1.3 Multilateral Loans and Technical Assistance:

Other multilateral agencies that support India through project loans, both soft as well as market based loans and technical assistance, which can be a component of a loan and also can be in the form of a grant are:

- The World Bank
- ADB
- International Fund for Agricultural Development (IFAD)
- Internatinal Finance Corporation (IFC)[25]

5.1.1.4 Soft Loans/Technical Assistance:

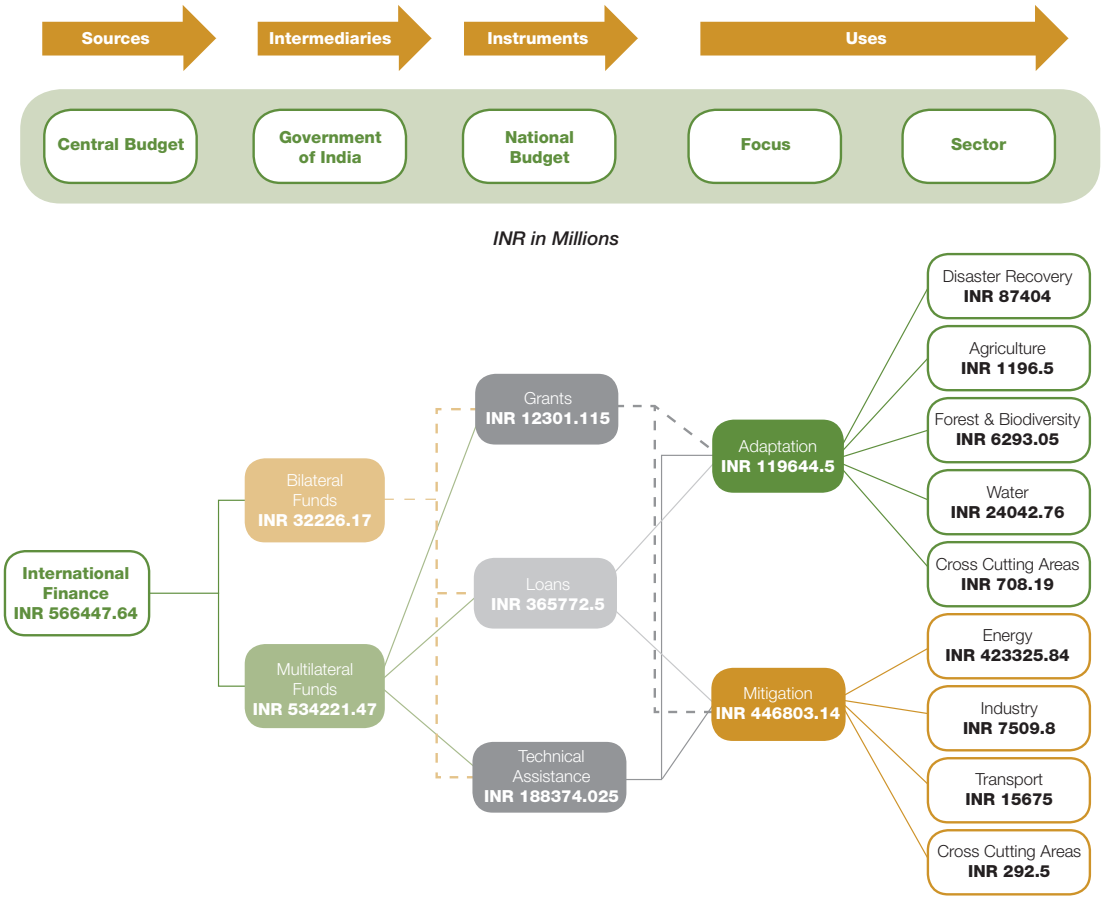
India receives a fair amount of assistance from KfW. This is in the form of loans, though, a long gestation period for repayment, with extremely soft interest rates, is allowed on some.

- KfW (Germany)[26]

[21] Switzerland also provides mixed credit comprising 40 percent grant and 60 percent loan for power sector projects.
[22] Sweden has stopped grants to India since 2007, but has a technical cooperation agreement with India for areas such as environmental protection, sustainable development and social development. These will be in the form of technical cooperation and assistance and no direct financial flows.
[23] NORAD has recently started institution-to-institution cooperation for the environment sector.
[24] Indo-French Development Cooperation is primarily aimed at addressing climate change, though under the broad umbrella of "sustainable management of global public goods."
[25] IFC provides loan through 4 instruments namely, loans, equity, risk management and guarantee. But for the purpose of this study, we have only considered those IFC projects financed through loan and/or equity.
[26] KfW also provides reduced interest loan for projects and also gives grants under special circumstances.

Figure 5 indicates the broad structure of climate finance flows in India. These figures only include international public finance received by India.

Figure 5: Climate finance in India[27]



[27] Source:Adapted to the Indian context from Climate Policy Initiative's 'Landscape of Public Climate Finance in Indonesia'

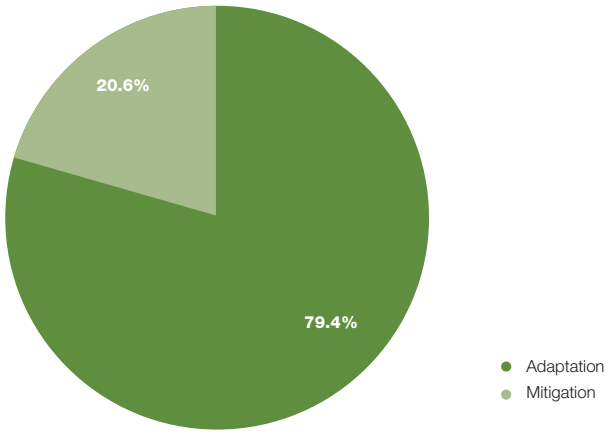
6.

Adaptation and Mitigation Balance of All Financial Flows
(Domestic and International)

6.1.1 Domestic Budgetary Allocation

Financial outlays towards the NAPCC have already been outlined in the sections above. However, it is important to note that, since the NAPCC leans towards adaptation activities, almost 80 percent of the intended finance has been allocated towards climate change adaptation. This is also shown in Figure 6.

Figure 6: Finance for adaptation and mitigation programs under the NAPCC[26]



[26] Source: Based on information collected from the NAPCC (2008).

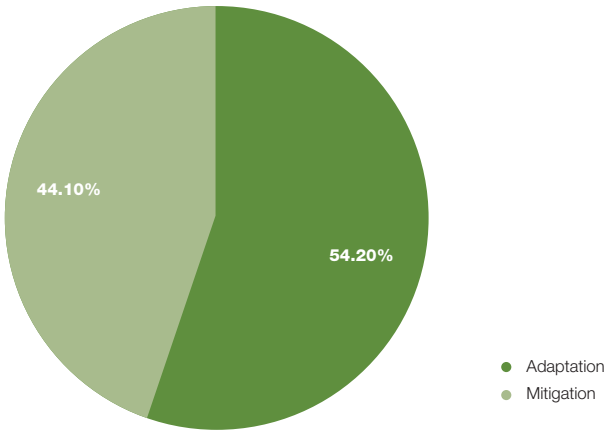
Figure 6 gives a broad indication of the country's priorities as perceived by Indian policy makers. Over the years, budgetary allocation has increased for areas such as health improvement, drought proofing, flood control, and disease control. And, looking at Figure 6, demonstrating the tilt towards adaptation spending, the existing budgetary allocation in adaptation is supplemented by NAPCC missions that are largely directed towards improvement in sustainability of ecosystem services. The figures for both adaptation and mitigation are only for projects envisaged under the missions.

However, there are additional initiatives though not targeted explicitly at climate change, such as renewable energy targets to be implemented by 2020, or the appliance efficiency labeling program, and the more recently launched vehicle efficiency labeling program, which address energy security and enhancement of efficient use of energy. While the primary motivation for these initiatives is to respond to the growing energy import dependence, the peripheral benefit is that they also address climate change. An analysis of budgetary allocation for the BEE and Ministry of Power for energy efficiency and conservation programs indicates that the budgetary allocation for 2012-13 was approximately USD 66 million and INR 4 billion, respectively. Similarly, the budgetary allocation for MNRE for 2012-13 was approximately USD 200 million.

Therefore, it seems that efforts for mitigation in terms of budgetary allocation account for a mere 20 percent of the total budgetary allocations for tackling climate change. However, if all other estimates are factored in, the percentage would possibly go up to 25 to 30. This, of course, also does not factor in the climate-related investments from the private sector, which are primarily in the energy efficiency and renewable energy sectors, thus changing the overall composition of climate finance expenditure in India.

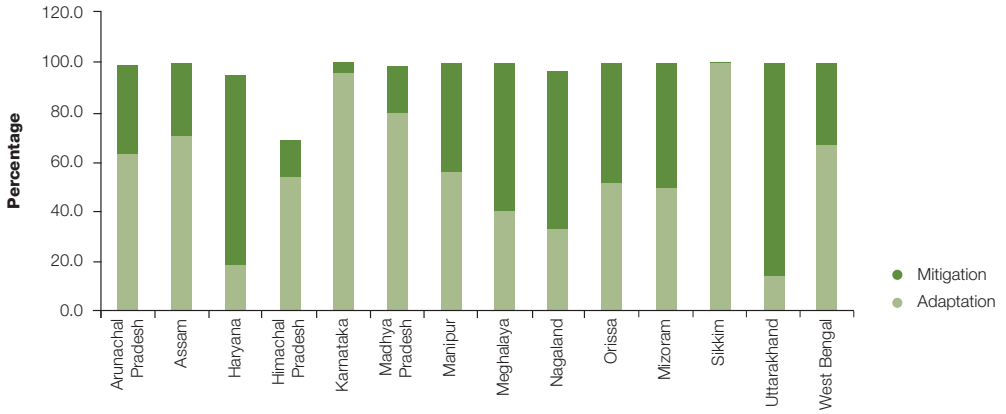
As can be seen in Figure 7, the budgetary estimates for SAPCCs on climate change also indicate greater spending on adaptation.

Figure 7: Adaptation vs. mitigation spending in the states with approved climate action plans[29]



[29] Source: Based on information collected from the various state climate action plans available in the public domain

Figure 8: Projected climate finance requirements for the 14 states[30]



As can be seen in Figure 8, the finance requirements of coastal and mountainous states such as West Bengal and Sikkim favor greater adaptation spending. The only anomaly is Uttarakhand, whose plan favors greater allocation for mitigation even though it was devastated by a massive flood in 2013.

One reason for mitigation activities not being a priority for the states is that the bulk of the mitigation-oriented programs, primarily related to energy efficiency, conservation and renewable energy are already covered under the NAPCC. So the states already have a source of revenue from budgetary allocations for these programs.

6.1.2 Bilateral and Multilateral Grants

Based on information available from the bilateral and multilateral agencies that have been covered in this mapping, a total of INR 12301 million has been provided to India in the form of grants till date (starting from 2007). These flows consist of grants for activities covering both climate change mitigation and adaptation. The bulk of the grants have flowed in mainly from bilateral agencies such as USAID, DFID, and a major international source for climate financing, GEF.

6.1.3 Bilateral and Multilateral Loans

All bilateral and multilateral loans that India has received, from 2007 till date, total INR 365772.5 million. These loans have been provided mainly by multilateral agencies such as the World Bank and ADB. The loan amount tracked as part of this mapping consists of flows towards activities covering both climate change mitigation and adaptation.

6.1.4 Bilateral and Multilateral Technical Assistance

Technical assistance provided to India by bilateral and multilateral agencies, since 2007, totals INR188374 million. Technical assistance can be both in the form of grants and loans, and since the form of the flows provided to India was not clear, these amounts have been considered as technical assistance without classifying them into loans or grants.

[30] Source- Based on information collected from the various State Climate Action Plans available in the public domain.

6.2 Profile of Adaptation Projects (Sectors and Coverage)

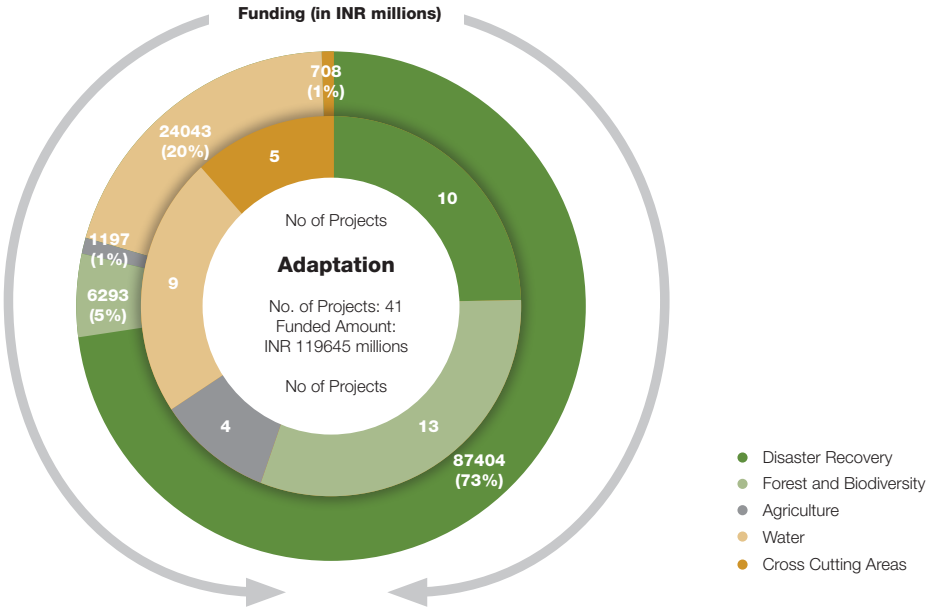
Tables 4 and 5 provide an overview of the international financial flows for adaptation and mitigation projects in India since 2007 till date.

Table 4: International finance flows for climate change adaptation in India

Adaptation		
Sector	**No. of Projects**	**Funded Amount (INR millions)**
Disaster Recovery	10	87404
Forest and Biodiversity	13	6293.05
Agriculture	4	1196.05
Water	9	24042.76
Cross Cutting Areas	5	708.19
Total	**41**	**119644.5**

The total amount that India has received for climate change adaptation through loans, grants or technical assistance over a period of seven years is INR 119,645 million approximately, translating to roughly USD 2392.9 million or USD 2.392 billion. [31]Figure 9 shows the total finance flows received for climate change adaptation in India.

Figure 9: Distribution of international finance flows for adaptation in India[32]



[31] Currency conversion rates taken as an average value over the last five years to arrive at the USD equivalent are:
1 Dollar ($) = 50 INR
1 Euro (EUR) = 65 INR
1 Swiss Franc (CHF) = 55 INR
1 Great Britain Pound (£) = 85 INR
[32] Source: Based on information collected through primary and secondary research.

6.2.1 Profile of Adaptation-Related Grants

In comparison to the total financial flows to India, grants for adaptation-related activities are in the region of INR 1211.71 million. These grants have been mainly instrumental in supporting activities in the agriculture, forestry, and water sectors. The states that have been the primary beneficiaries are Himachal Pradesh, Haryana, Karnataka, Sikkim, and Madhya Pradesh.

6.2.2 Profile of Adaptation-Related Loans and Technical Assistance

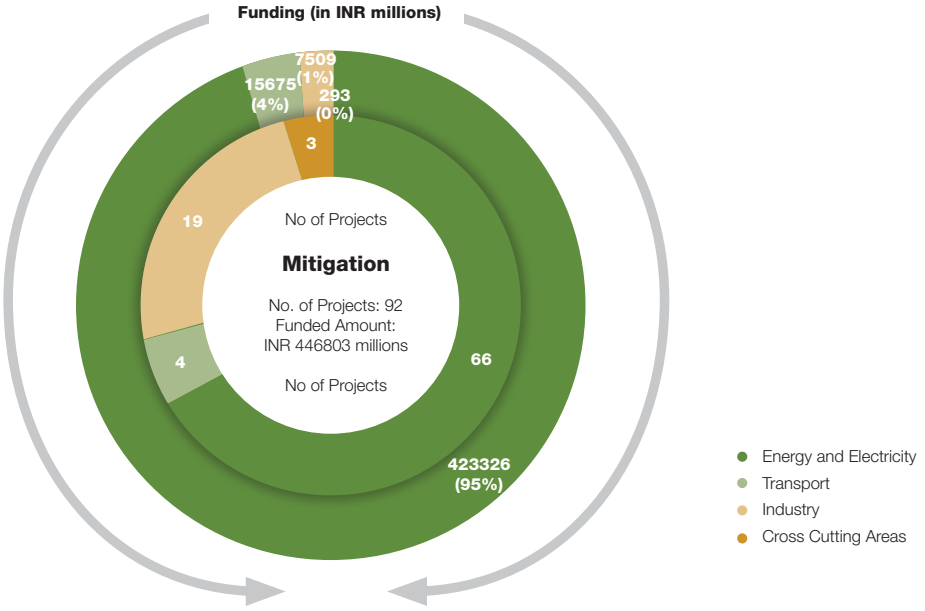
The only recipient of adaptation-related loans is Himachal Pradesh, and the adaptation-related flows in the form of loans and technical assistance amount to INR 118432.79 million. Bi-lateral and multilateral assistance for adaptation-related activities has been largely in the form of grants because support for adaptation is supposed to help countries cope with the impacts of climate change and, generally, does not generate.revenues. Therefore, due to the risk attached in disbursing loans for climate change adaptation, loans and technical assistance in this domain have been less relevant.

6.3 Profile of Mitigation Projects

Table 5: International finance flows for climate change mitigation in India

Mitigation		
Sector	**No. of Projects**	**Funded Amount (INR millions)**
Energy and Electricity	66	423325.84
Transport	4	15675
Industry	19	7509.8
Cross Cutting Areas	3	292.5
Total	**92**	**446803.14**

Figure 10: Distribution of international finance flows for mitigation in India[33]



[33] Source: Vasudha Foundation research.

The total amount that India received for mitigating climate change through loans, grants or technical assistance over the last seven years is INR 446803 million, translating to approximately USD 8.9 billion.

6.3.1 Profile of Mitigation-Related Grants

The sectors that receive grants for climate change mitigation are electricity and energy, transport, and industry. India has received grants for the electricity and energy sector, from 2007 till date, totalling approximately INR 9652.71 million. The grants have been given to implement projects to bring about an overall change in the Indian energy scenario. Additionally, the transport sector received INR 460 million for the same time period.

The total amount that India received by way of grants for projects in the industry sector, from 2007 till date, is approximately INR 976.7 million.

6.3.2 Profile of Mitigation-Related Loans and Technical Assistance

The largest recipient of mitigation-related loans in India is the electricity and energy sector. The total amount that India has received as loans and technical assistance for the sector, since 2007 till date, is approximately INR 413673.13 million. Most loans have been directed towards increasing the deployment of renewable energy and improving the efficiency of the transmission and distribution network in India. The energy sector is supported by loans because infrastructure creation results in revenue generation that can be used to repay the loans.

The transport sector has also been the recipient of large loans. Since 2007, it has received approximately INR 14061.5 million for activities resulting in promotion of low carbon transport.

6.4 Analysis of Adaptation and Mitigation Project Profiles – Alignment of External Financial Flows in Relation to India's Climate Priorities

The total number of climate change adaptation and mitigation projects in India covered in this mapping (from 2007 till date) are 41and 92, respectively. In terms of external financial flows, mitigation continues to receive the highest support from both bilateral and multilateral agencies. Of the total number of climate change-related projects covered in this mapping, it was found that 69 percent were focused on climate change mitigation and received 81 percent of the total external financial flows. This does not include the government's budgetary support as extended to the Jawaharlal Nehru National Solar Mission and National Mission on Enhanced Energy Efficiency. GoI has also highlighted low-carbon development as a priority, and its continued focus on enhanced energy access and improved energy security has resulted in the mitigation projects being dominated by the renewable energy sector. Amongst all the sectors, the energy sector has been the recipient of the largest grants and loans from various bilateral and multilateral agencies covered in this mapping.

However, as can be seen in the various SAPCCs and NAPCC itself, India accords a high priority to climate change adaptation, that is financed mostly by domestic resources. Moreover, external financial flows for adaptation-related activities constitute only 19 percent of the total climate finance flows that India receives.

Figure 11: Distribution of projects between adaptation and mitigation[34]

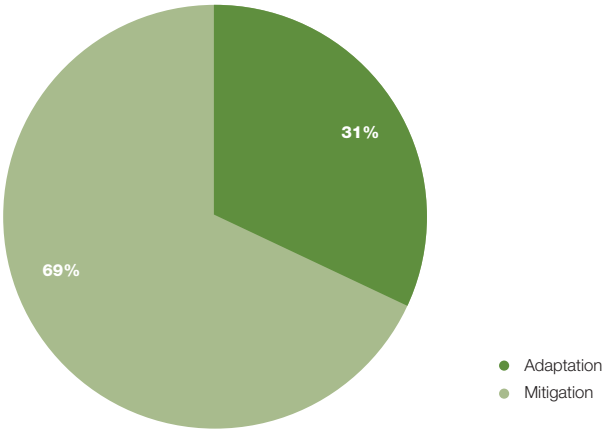
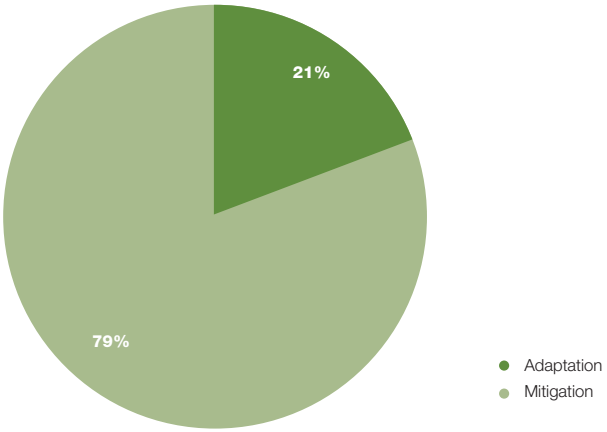


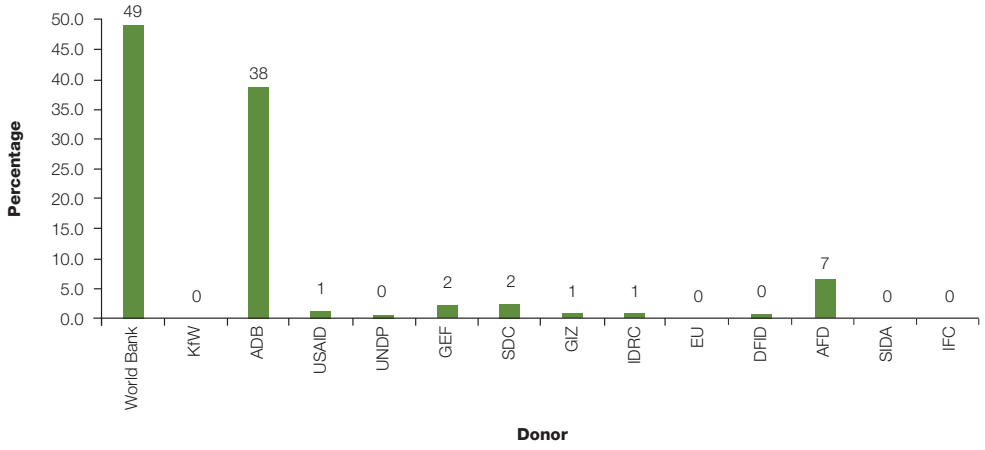
Figure 12: Distribution of funds between adaptation and mitigation[35]



The largest share of climate finance is directed towards mitigation projects in India. Mitigation finance provided as soft loans, a dominant financial instrument, resulting in repayment obligations and future finance outflows for India, also serves as returnable capital.

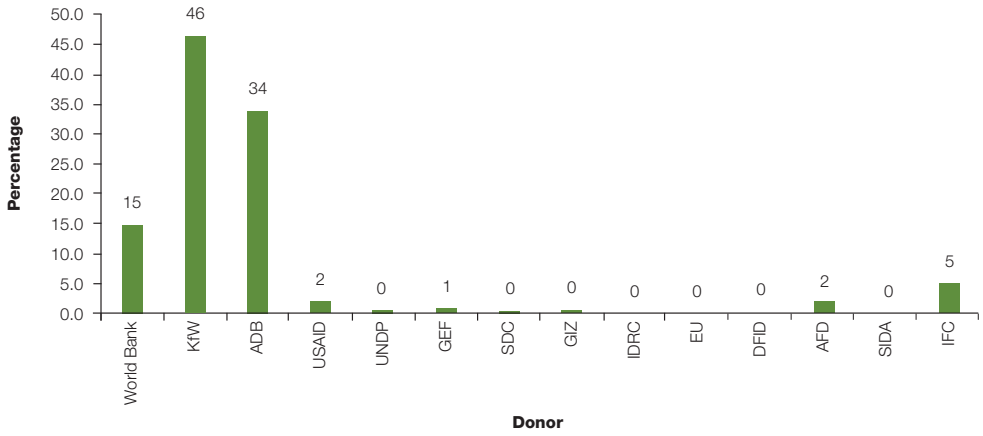
[34] Source: Based on information collected through primary and secondary research.
[35] Ibid.

Figure 13: Provision of external adaptation finance in percentage by contributors[36]



Of the multilateral and bilateral agencies providing climate finance support to India, which have been mapped in this report, ADB and the World Bank provide the largest share of adaptation support.

Figure 14: Provision of external mitigation finance in percentage by contributors[37]



The largest number of mitigation projects are supported by multilateral agencies such as the World Bank, ADB and KfW; and, as mentioned earlier, the majority of financial support for these projects is directed towards the energy sector.

[36] Ibid.
[37] Ibid.

Figure 15: Percentage-wise distribution of adaptation projects supported by donors[38]

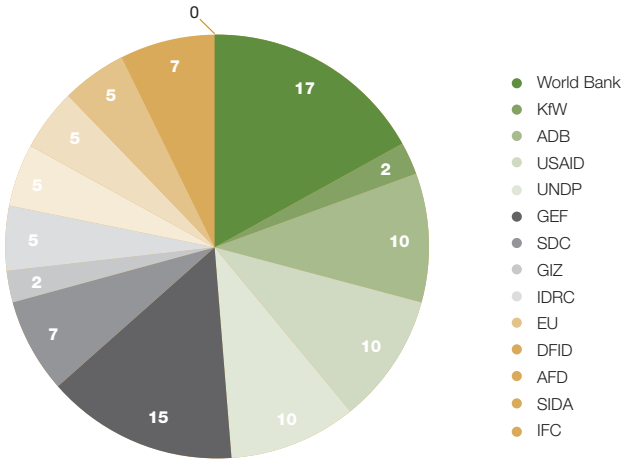
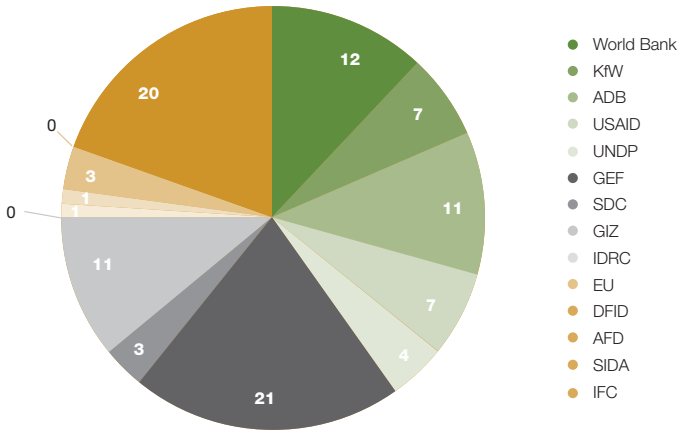


Figure 16: Percentage-wise distribution of mitigation projects supported by donors[39]



GoI has stated numerous times that, despite its domestic spending on climate change adaptation, the magnitude of its adaptation efforts necessitates that it requires external financial support, particularly as international public finance. However, external flows received by India are heavily tilted towards climate change mitigation. Hence, it can be said that the external financial flows are not aligned with India's climate priorities.

6.5 Financial Flows in Relation to Assessed Financial Needs and Outlays

As per GoI estimates, a total of USD 37.16 billion is required to implement the plans envisaged under the eight missions of NAPCC. A further USD 200 million is required to implement the SAPCCs for 14 states, totaling approximately USD 37.35 billion over a period of five years or approximately USD 8 billion per year.

[38] Ibid.
[39] Ibid.

As far as money flow into the country is concerned, India has received through the various bilateral, multilateral and existing financial mechanisms, a total of approximately USD 11.3 billion or approximately USD 1.13 billion per year for the period 2007-14. Many projects and programs are, in a way, connected to some of the programs and activities envisaged under NAPCC and also SAPCCs.

Therefore, in relation to the estimated requirement and flows, the funding gap is approximately USD 7.3 billion per year. Further, the National Clean Energy Fund (NCEF) created by GoI, which levies a cess of INR 50 (approximately USD 1) on one ton of coal (both domestic and international), is expected to have approximately USD 1.6 billion by 2015 and possibly add approximately USD 500 million to USD 1 billion every year. This further reduces the funding gap to approximately USD 6.3 billion per year.

7.

Key Findings

- India is a beneficiary of fairly large financial flows from bilateral and multilateral agencies as financing for adaptation and mitigation projects.
- However, there is a continued gap between the assessed need to meet the adaptation and mitigation requirements and current flow of finances from multilateral, bilateral and other agencies.
- Most projects funded by bilateral and multilateral agencies do not necessarily conform to national priorities, as identified by GoI. This is indicative of the fact that a large share of bilateral and multilateral loans and grants flow in for mitigation-oriented projects, while GoI's priority area, as indicated in the NAPCC and SAPCCs is knowledge building and adaptation.
- However, this also possibly indicates GoI's willingness to further expand the renewable energy sector.
- The nature of some climate finance projects that come under the purview of mitigation projects can be questioned as being "low carbon." There is a continued substantial support given to projects that involve energy generation on a fossil-fuel basis such as "clean coal", "super-critical thermal power plants", "efficiency improvements of thermal power plants" and the like.
- However, it is interesting to note that the share of projects for renewable energy and energy efficiency in the overall portfolio of funded projects is higher. Of a total of 92 projects in the portfolio of mitigation projects, 45 are for renewable energy alone.
- There is a significant uncertainty around how much climate-relevant finance is being disbursed through some of the more traditional development projects under the broadly based ODA. A look at project profiles, however, indicates that nowadays most of these development projects contain climate-relevant components and thus expenditure, although a quantification of the climate-specific allocations is difficult to impossible.
- There is a significant uncertainty as to the usage of some of the domestic funds. For example, the exact purpose and usage of the NCEF is still an open question.
- From the literature available and from our research, it is also not fully clear how SAPCC needs are being supported financially. As of now, only projects and activities implemented by the states as part of the NAPCC seem to have budgetary support.
- However, the possibly redeeming situation for the states is that they also seem to have access to bilateral and multilateral project financing. A substantial number of projects are implemented in direct cooperation with states. Of the total of 133 climate projects financed by international donors, some 57 are projects implemented in direct cooperation with Indian states.
- In addition to the NCEF, which is to be funded by a cess on coal as its key source of revenue, there is no dedicated domestic climate finance mechanism. However, we understand that the Ministry of Finance and the Planning Commission are looking into this issue.
- On the institutional and governance aspect of climate financing, all decisions seem to be made by the Ministry of Finance, based on the position advocated by the MoEF, particularly in the context of the UNFCCC process and discussions around climate finance. No other ministry or department has, so far, had a role to play in the decisions made by India on climate finance. The government ministries largely excluded from national climate change policy making include MNRE, Ministry of Power, Ministry of Urban Development, Ministry of Rural Development, Ministry of Agriculture, Ministry of Water Resources, and Ministry of Transport, amongst others.
- While India does not have a Measuring, Reporting, and Verification (MRV) process to track project financing or financial flows, per se, all bilateral and multilateral financial flows into the country are recorded by the Department of Economic Affairs, Ministry of Finance. This information is made available online and fairly easily accessible.

8.

Recommendations

- The issue of climate finance is important to a number of departments and ministries both at GoI as well as at the state government level. It is, therefore, important that all decisions on climate financing, whether related to "need assessment" or "project and financing determination," are made in coordination with all concerned departments and ministries, and should involve the state planning commissions.
- It is also important that GoI put in place a mechanism to involve civil society groups and other stakeholders in decisions regarding climate finance.
- India needs to put in place a mechanism that is capable to raise domestic finance to meet the climate change needs of the country. As of now, there seems to be only one dedicated fund, the NCEF, with just one revenue source stream, which is "cess on coal".
- India also needs to design a dedicated financial and governance instrument to link national government climate plans and state level expenditures on climate change, so as to improve the delivery of domestic climate finance.
- Further, India needs to put in place a domestic MRV mechanism on various financial flows. It needs to go beyond mere reporting, but also look into the qualitative aspects of financial flows.

Annexes

AGRICULTURE
Bilaterally and Multilaterally
Funded Adaptation Projects (Grants)

GEF
USAID
EU

ELECTRICITY & ENERGY
Bilaterally and Multilaterally Funded
Mitigation Projects (Grants)

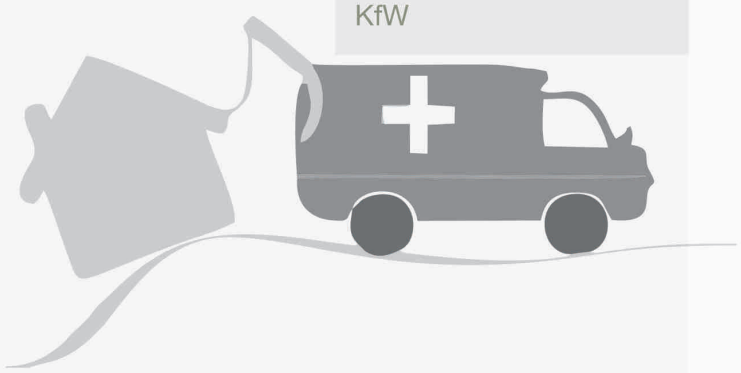
USAID
GEF
UNDP
SDC
GIZ
EU

WATER
Bilaterally and Multilaterally
Technical Assistance
Projects for Adaptation

ADB
DFID
WORLD BANK
SDC

DISASTER RECOVERY
Bilateral and Multilaterally
Technical Assistance
Projects for Adaptation

ADB
USAID
SDC
KfW



FOREST BIODIVERSITY
Bilaterally and Multilaterally Funded
Adaptation Projects (Loans)

WORLD BANK

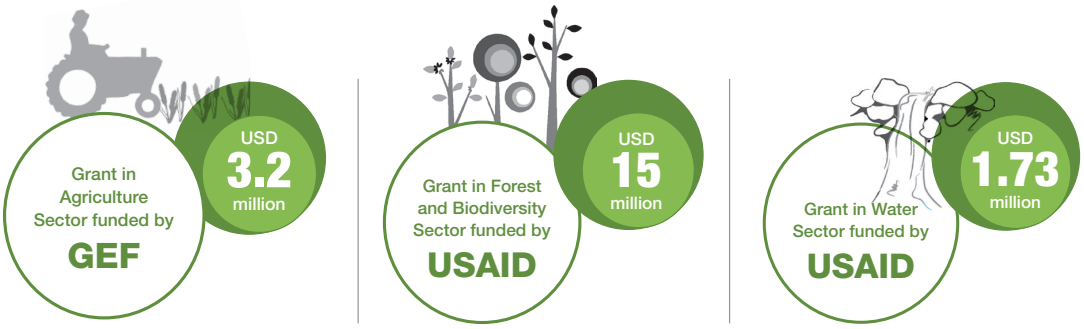
Annex I

Bilaterally and Multilaterally Funded Adaptation Projects (Grants)

1. Agriculture

Description of projects in the agriculture sector supported by grants

S. No.	Project and Description	Amount (in Million)	Agency
1.	**Mainstreaming Agro-biodiversity Conservation and Utilization in Agricultural Sector to Ensure Ecosystem Services and Reduce Vulnerability**[40] The project lays emphasis on conservation, use of agro-biodiversity for resilience and encouraging sustainable production and benefit-sharing across four eco regions of India. This will help secure the maintenance of crop diversity and its adaptation to changing climatic conditions, and increasing farmers' access to crop genetic resources, so that farmers benefit from having locally adapted materials in population sizes large enough to buffer against change in climate and other factors, and ensure sustainable agriculture. Time Period: April 12, 2013 (date of approval)	USD 3.2	GEF



[40] http://addis.unep.org/projectdatabases/00906/project_general_info.

2. Forest and Biodiversity

Projects in the forest and biodiversity sector supported by grants

S. No.	Project and Description	Amount (in Million)	Agency
1.	**FOREST PLUS: Sustainable Forests and Climate Adaptation**[41] The project will contribute to USAID/India's Assistance Objective of accelerating India's transition to a low emissions economy by taking enhanced Reducing Emissions from Deforestation and forest Degradation (REDD+) actions to scale. The project aims to reduce emissions from deforestation and forest degradation and enhance sequestration through afforestation, conservation, and sustainable management of forests in Madhya Pradesh, Himachal Pradesh, Sikkim and Karnataka. Time Period: August 8, 2012-September 30, 2017	USD 15	USAID

3. Water

Projects in the water sector supported through grants

S. No.	Project and Description	Amount (in Million)	Agency
1.	**Development Grants Program (DGP)-Water-Agriculture-Livelihood Security in India**[42] To promote climate change adaptation and water sustainability while improving farmer livelihood and food security in three key regions, namely, Punjab, Gujarat and Jharkhand in India. This will be achieved through the following tasks: Task 1: Integrated assessment of the hydro-climatology, crops, and water and energy systems. Task 2: Economic analysis of short and long term farmer and state level outcomes relative to climate, water and energy scenarios. Task 3: Farm level implementation of specific water and energy saving methods. Task 4: Climate and market informed agricultural supply chain development. Task 5: Synthesis, results dissemination and policy change stimulation. Time Period: June 1, 2012 - 30 May, 2017	USD 1.73	USAID
2.	**High Noon: adaptation to changing water resources availability in northern India with Himalayan glacier retreat and changing monsoon pattern**[43] The principal aim of the project was to assess the impact of Himalayan glaciers retreat and possible changes of the Indian summer monsoon on the spatial and temporal distribution of water resources in Northern India and to provide recommendations for appropriate and efficient response strategies that strengthen the cause for adaptation to hydrological extreme events. Time Period: May 5, 2009 - April 30, 2012	3.311 Euros	EU

[41] http://map.usaid.gov/PublicProjectDetail?id=a0cd00000033GLRAA2&cid=India
[42] http://map.usaid.gov/PublicProjectDetail?id=a0cd00000033GLTAA2&cid=India
[43] http://cordis.europa.eu/projects/rcn/92054_en.html

Annex II

Bilaterally and Multilaterally Funded Adaptation Projects (Loans)

1. Disaster Recovery

Disaster recovery projects supported through bilateral and multilateral loans

S. No.	Project and Description	Amount (in Million)	Agency
1.	**Uttarakhand Disaster Recovery Project**[44] The objective of the Uttarakhand Disaster Recovery Project for India is to restore housing, rural connectivity and build resilience of communities in Uttarakhand and increase the technical capacity of the state entities to respond promptly and effectively to an eligible crisis or emergency. Time Period: October 25, 2013-December 31, 2017	USD 250	World Bank
2.	**Tamil Nadu and Puducherry Coastal Disaster Risk Reduction Project**[45] The objective of the project is to increase the resilience of coastal communities in Tamil Nadu and Puducherry, to a range of hydro meteorological and geophysical hazards along with improving project implementation entities' capacity to respond promptly and effectively to an eligible crisis or emergency. Time Period: June 20, 2013-July 31, 2018	USD 236	World Bank

[44] http://www.worldbank.org/projects/P146653?lang=en
[45] http://www.worldbank.org/projects/P143382/tamil-nadu-puducherry-coastal-disaster-risk-reduction-project?lang=en

S. No.	Project and Description	Amount (in Million)	Agency
3.	**Assam Integrated Flood and Riverbank Erosion Risk Management (FREM) Investment Program**[46] The goal of the project is to support the economic and poverty reduction efforts of the state governments through integrated FREM along the Brahmaputra river and its tributaries. The project aims to promote people's livelihoods, through comprehensive FREM measures, which will provide protection from river erosion and floods, with a focus on the most vital areas of economic and national interests. An adaptive process approach is proposed that will protect critical reaches first, and then replicate suitable measures to other areas later. Nonstructural measures, including improved flood forecasting and warning, flood plain zoning, community preparedness, etc., will be adopted with intensive stakeholder participation Time Period: (approval date of the facility concept) October 19, 2010	USD 177	ADB
4.	**India National Cyclone Risk Mitigation Project**[47] The objective of the first phase of the project is to reduce the vulnerability of coastal communities in Andhra Pradesh and Odisha to cyclone and other hydro meteorological hazards. Time Period: June 22, 2010- October 31, 2015	USD 255	World Bank
5.	**Odisha Disaster Recovery Project**[48] The development objective of the project is to restore and improve housing and public services in targeted communities of Odisha, and increase the capacity of the state entities to respond promptly and effectively to an eligible crisis or emergency. Time Period: February 20, 2014-March 31, 2019	USD 153	World Bank
6.	**Bihar Kosi Flood Recovery Project**[49] The development objective of the project is to support flood recovery as well as future oriented risk reduction efforts of the Government of Bihar through: (i) reconstruction of damaged houses and road infrastructure; (ii) strengthening the flood management capacity in Kosi basin; (iii) enhancing livelihood opportunities of the affected people; and (iv) improving the emergency response capacity for future disasters. Time Period: September 9, 2010-September 14, 2014	USD 220	World Bank

[46] http://www.adb.org/projects/38412-013/main
[47] http://www.worldbank.org/projects/P092217/india-national-cyclone-risk-mitigation-project-1?lang=en
[48] http://www.worldbank.org/projects/P148868?lang=en
[49] http://www.worldbank.org/projects/P122096/bihar-kosi-flood-recovery-project?lang=en

2. Forest and Biodiversity

Projects in the forest and biodiversity sector supported by loans

S. No.	Project and Description	Amount (in Million)	Agency
1.	**Strengthening the Enabling Environment for Biodiversity Conservation and Management in India**[50] The project objective is to provide assistance in meeting the national reporting requirements to the Convention on Biological Diversity by India which includes revision of the National Biodiversity Strategy and Action Plan as well as preparation of the fifth National Report for Biodiversity and second National Report for Bio-safety. Time Period: June 29, 2012-May 8, 2014	USD 0.27	GEF
2.	**Biodiversity Conservation and Sustainable Management of the Forest of Assam**[51] The project aims sustainable management of forest areas and biodiversity conservation in Assam.	EUR 54	AFD

3. Water

Projects in the water sector supported through loans

S. No.	Project and Description	Amount (in Million)	Agency
1.	**Himachal Pradesh Watershed Management Project**[52] The project development objective is to: (i) reverse the process of degradation of the natural resource base and to improve the productive potential of natural resources and incomes of the rural households in the project areas; and (ii) support policy and institutional development to harmonize watershed development projects and policies across the state in accordance with best practices. Time Period: November 20, 2012-December 31, 2018	USD 8	World Bank
2.	**Improve the Supply of Drinking Water to the City of Jodhpur**[53] The project goal is to provide support to the Government of Rajasthan, in its urban development policy and help in optimizing the supply and distribution of water in Jodhpur. This is specifically financing the rehabilitation and extension of drinking water network in Jodhpur (Rajasthan). Thus the project aims to support the development of the city of Jodhpur in limiting the impact on climate change by way of urban development. Time Period: December 2010	EUR 71.1	AFD

[50] http://www.worldbank.org/projects/P128634/strengthening-enabling-environment-biodiversity-conservation-management-india?lang=en
[51] http://www.afd.fr/lang/en/home/pays/asie/geo-asie/inde/portfolio/conservation-biodiversite-et-gestion-durable-foret-d-assam
[52] http://www.worldbank.org/projects/P104901/himachal-pradesh-watershed-management-project?lang=en
[53] http://www.afd.fr/lang/en/home/pays/asie/geo-asie/inde?actuCtnId=75434

Annex III

Bilateral and Multilaterally Technical Assistance Projects for Adaptation

1. Disaster Recovery

Disaster recovery projects supported through technical assistance

S. No.	Project and Description	Amount (in Million)	Agency
1.	**Operational Research to Support Mainstreaming of Integrated Flood Management under Climate Change**[54] Technical assistance provided by ADB will undertake operational research to identify and test integrated flood mitigation and flood plain management strategies appropriate for India. The strategies will balance structural and nonstructural measures and provide the mechanisms for mainstreaming integrated flood management at different government levels. Time Period: June 1, 2012 (date of approval)	USD 420	ADB
2.	**Disaster Management Support**[55] The project aims to reduce disaster risk in urban areas by enhancing institutional capacities to integrate climate risk reduction measures in development programs as well as to undertake mitigation activities based on scientific analysis; and enhance community capacities to manage climate risk in urban areas of Andhra Pradesh, Odisha, Rajasthan, Tamil Nadu, and Sikkim by enhancing their preparedness levels. Time Period: October 1, 2012-September 30, 2015	USD 1.62	USAID

[54] http://www.adb.org/projects/documents/operational-research-support-mainstreaming-integrated-flood-management-under-climate-change-tar
[55] http://map.usaid.gov/PublicProjectDetail?id=a0cd00000033GLnAAM&cid=India

S. No.	Project and Description	Amount (in Million)	Agency
3.	**Climate Resilience through Risk Transfer using Micro insurance Solutions**[56] The project goal is to enhance climate resilience and promote adaptive capacities of vulnerable communities (in Bihar and Maharashtra) through development, testing and promotion of risk transfer options and solutions (climate insurance).	CHF 32	SDC
4.	**Increasing Resilience to Climate Impacts of Vulnerable Communities and Critical Ecosystems in the Eastern Himalayas of India** A study funded by Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (BMU) will provide data to identify some of the most critical issues and sites for enhanced climate change adaptation, where it is apparent that climate impacts will render communities and ecosystems more vulnerable unless certain practices are modified. However, more detailed studies are needed to further refine strategies, and to identify and prioritize additional vulnerable areas and communities. A feasibility study and a preliminary climate vulnerability assessment are therefore being financed, as well as a first implementation of pilots on a minor scale in already identified sectors and regions. Time Period: July 2009-December 2010 Source: http://www.international-climate initiative.com/en/projects/projects/	EUR 0.2	KfW

2. Agriculture

Agriculture projects supported by technical assistance

S. No.	Project and Description	Amount (in Million)	Agency
1.	**Sustainable Rural Livelihoods and Security through Innovations in Land and Ecosystem Management /Additional GEF financing to India's National Agricultural Innovation Project**[57] The project will support the development and implementation of innovations in agriculture through collaboration among fanners, private sector, civil society, and public sector organizations. The GEF support is incremental to the original project and will finance activities that address, specifically, land degradation, biodiversity and adaptation to climate change. The GEF support will also pilot local operationalization of adaptation strategies to climate change. The global objective of the project for additional financing is to strengthen institutional and community capacity on sustainable land and ecosystem management approaches and techniques for restoring and sustaining the natural resource base, including its biodiversity, while taking account of climate variability and change. Time Period: October 4, 2009-June 30, 2014	USD 7.34	GEF

[56] www.swiss-cooperation.admin.ch/.../ressources/resource_en_222536.pdf
[57] http://www.worldbank.org/projects/P112060/sustainable-rural-livelihoods-security-through-innovations-land-ecosystem-mgmt-additional-gef-financing-india-naip?lang=en

S. No.	Project and Description	Amount (in Million)	Agency
2.	**Sustainable Livelihoods and Adaptation to Climate Change**[58] The project aims at reducing the vulnerability of climate variability and change with the help of community-based interventions in selected agro-ecological zones. It focuses on the inclusion of small farmers, landless, migrant labor, and other social, economic and geographic population groups which are most vulnerable to climate variability and change. Time Period: June 7, 2012 (date of approval)	USD 8	GEF
3.	**Strengthening the Capacities of Communities and Institutions to Adapt to Climate Change in Semi-Arid and Rain-fed Regions**[59] The project aims at enhancing the capacities of the rural communities in village clusters of Maharashtra, Madhya Pradesh and Andhra Pradesh to adapt to climate change impacts. Time Period: April 2009-March 2014	CHF 4.9	SDC

3. Forest and Biodiversity

Projects in the forest and biodiversity sector supported by technical assistance

S. No.	Project and Description	Amount (in Million)	Agency
1.	**Participating Agency Partnership Agreement– U.S. Forest Service**[60] The purpose of this ageement is to build capacity of MoEF to take REDD+ actions to scale. Activities under this afreement are divided into two phases. Phase 1 covers trainings to bolster Indian expertise in completing carbon estimations, forest inventories, and related analyses. Activities in Phase 2 will build upon momentum generated during Phase 1 to implement and improve data collection and decision-making tools for forest resources (including carbon) assessments, and monitoring & management at multiple scales. Time Period: August 1, 2010-September 30, 2014	USD 1.25	USAID
2.	**Conserving Biodiversity in the Mountain Landscape**[61] To strengthen institutional capacities for conservation of globally significant biodiversity in production forests of central Indian highlands and Western Ghats hotspots with co-benefits of enhanced carbon sequestration and sustainable flow of ecosystem services. Time Period: February 29, 2012-February 28, 2013	USD 1	GEF

[58] http://www.worldbank.org/projects/P132623?lang=en
[59] www.swiss-cooperation.admin.ch/india/en/.../resource_en_222540.pdf
[60] http://map.usaid.gov/PublicProjectDetail?id=a0cd00000033GLQAA2&cid=India
[61] http://www.undp.org/content/undp/en/home/ourwork/environmentandenergy/focus_areas/ecosystems_and_biodiversity/projects_websites.html

S. No.	Project and Description	Amount (in Million)	Agency
3.	**Mainstreaming Coastal and Marine Biodiversity into Production Sectors in Sindhudurg Coast in Maharashtra**[62] The project aims to mainstream biodiversity conservation into Sindhudurg coastal district's production sectors. It also seeks to generate awareness among local communities on biodiversity conservation amidst the threat of unsustainable fishing practices, rising pollution from fishing vessels and maritime traffic in the region. Time Period: June 2011-March 2016	USD 3.43	UNDP
4.	**Strengthening Institutional Structures to Implement the Biological Diversity Act**[63] The project aimed to enable effective implementation of the national biodiversity policy framework in India, the project, in partnership with MoEF , aimed to strengthen institutional capacities at national and state levels, and initiate behavioral changes to manage natural resources in an integrated, participatory and sustainable manner. Time Period: 2009-2012	USD 1.18	UNDP
5.	**Integrated Biodiversity Conservation and Ecosystem Services Improvement**[64] To strengthen institutional capacities for conservation of globally significant biodiversity in production forests of central Indian highlands and Western Ghats hotspots with co-benefits of enhanced carbon sequestration and sustainable flow of ecosystem services. Time Period: June 7, 2012 (date of approval)	USD 20.5	GEF
6.	**Strengthening Livelihood Security and Adapting to Climate Uncertainty in Chilika Lagoon, India**[65] The project will allow Wetlands International South Asia, in collaboration with local stakeholders, to identify management options for reducing risk and increasing community preparedness for changes in wetland systems due to climate variability. Researchers will elaborate scenarios of changes in ecosystem services due to climate variability; assess current coping mechanisms within vulnerable communities; demonstrate options for enhancing livelihood resilience through pilot interventions; formulate a "climate smart" plan for wetland management; and build the capacity of wetland managers to respond to climate change, particularly as it concerns livelihood resilience. Time Period: November 15, 2011-November 15, 2014	USD 0.5	IDRC

[62] http://www.in.undp.org/content/india/en/home/operations/projects/environment_and_energy/mainstreaming-coastal-and-marine-biodiversity-into-production-se/
[63] http://www.in.undp.org/content/india/en/home/operations/projects/environment_and_energy/strengthening_intitutionalstructurestoimplementthebiologicaldive/
[64] http://www.thegef.org/gef/BIO-strategy
[65] http://www.idrc.ca/en/themes/environment/pages/ProjectDetails.aspx?ProjectNumber=106703

S. No.	Project and Description	Amount (in Million)	Agency
7.	**Sustainable Management of Coastal and Marine Protected Areas** The project is developing and implementing participatory models for protecting and sustainably managing selected protected areas in coastal zones with the aim of preserving biodiversity and the livelihoods of the local population. Training measures improve the knowledge base and capacities of the Indian partners in co-management and expand the opportunities for Indian business and local interest groups to participate. Time Period: August 2012-July 2014 Source: http://www.international-climate initiative.com/en/projects/projects/	EUR 9.6	GIZ
8.	**Ecological Assessment and Education for Conservation of Mangrove Community in Ratnagiri District, Maharashtra**[66] The project aimed to document the ecological status and existing, as well as potential future threats, to the mangrove plant communities in the Ratnagiri district of Maharashtra. Surveys were conducted in the selected sites to analyze parameters such as species richness, community structure and floral species distribution patterns across biotic and abiotic factors. Based on the collected data, distribution maps were produced. The project further aimed to empower local communities to conserve the mangroves through awareness and education programmes. Meetings with stakeholders and village governing bodies were conducted to create platforms for the sharing of experiences and problems encountered in the conservation of mangroves at the ground level. Time Period: May 15, 2012-November 30, 2013	USD 0.017	SIDA
9.	**Stakeholder-led Management Planning for Vembanad-Kol Backwaters, Kerala**[67] The project was aimed at developing a management planning framework for conservation and wise use of Vembanad-Kol backwaters as a means to support mainstreaming of wetland ecosystem services and biological diversity into developmental planning and decision making processes. The objective was to design an ecologically and socioeconomically sound ecosystem restoration program for Vembanad-Kol backwaters, Kerala. Time Period: November 28, 2011-November 30, 2012	USD 0.017	SIDA
10.	**Survey and Assessment in Gulf of Mannar and Palk Bay to Support Strategy to Conserve and Manage Seagrass Habitats**[68] The project aimed to develop a long-term strategy for seagrass conservation in the Gulf of Mannar and Palk Bay; and enhance the knowledge of dugongs in the Gulf of Mannar. Time Period: December 20, 2011-February 28, 2013	USD 0.017	SIDA

[66] http://www.mangrovesforthefuture.org/grants/small-grant-facilities/india/ecological-assessment-and-education-for-conservation-of-mangrove-community-in-ratnagiri-district-maharashtra/
[67] http://www.mangrovesforthefuture.org/grants/small-grant-facilities/india/stakeholder-led-management-planning-for-vembanad-kol-backwaters-kerala/
[68] http://www.mangrovesforthefuture.org/grants/small-grant-facilities/india/survey-and-assessment-in-gulf-of-mannar-and-palk-bay-to-support-strategy-to-conserve-and-manage-seagrass-habitats/

4. Water

Projects in the water sector supported through technical assistance

S. No.	Project and Description	Amount (in Million)	Agency
1.	**Sustainable Coastal Protection and Management Investment[69] Program** The investment program will address immediate coastal protection needs and coastal instability using environmentally and socially appropriate solutions, with a focus on softer options such as artificial reefs, beach nourishments, and dune management in Goa, Karnataka, and Maharashtra. It will also develop institutional capacities to meet the long-term needs of sustainable coastal protection and management, and support initiatives to increase the participation of the private sector and communities in coastal protection and management. Time Period: September 29, 2010 (date of approval)	USD 301.55	ADB
2.	**Support for the National Action Plan on Climate Change[70]** ADB provided technical assistance to support action at the central and state levels to move the National Water Mission of the NAPCC recommendations towards a viable and programmed set of activities and investments. It is designed to engage in strategic planning and development of frameworks that will help meet India s needs for sustainable and robust water resource systems for climate change adaptation. The project will build on existing studies and on-going national and international research outputs. Time Period: December 22, 2010 (date of approval)	USD 0.95	ADB
3.	**Karnataka Watershed Development II[71]** The objective of the project is to demonstrate more effective watershed management through greater integration of programs related to rainfed agriculture, innovative and science-based approaches, and strengthened institutions and capacities. Time Period: August 6, 2012-December 31, 2018	USD 60	World Bank
4.	**What is the Evidence about Glacier Melt across the Himalayas?[72]** The aim of the project was to conduct a rigorous systematic review, to discern the evidence of glacier melt across the Himalayas, and support policy-making in the region. The region covered within the scope of this review contains the mountainous regions of the Hindu Kush, Karakoram and Greater Himalaya mountain ranges. These mountainous regions are the source of several major rivers, including the Indus, Ganges, and Brahmaputra. The review was particularly useful to those responsible for regional water resource planning and natural hazard management. Time Period: May 1, 2010-February 23, 2012	£4.73	DFID

[69] http://www.adb.org/projects/documents/sustainable-coastal-protection-and-management-investment-program-seia
[70] http://www.adb.org/projects/43169-012/main
[71] http://www.worldbank.org/projects/P104901/himachal-pradesh-watershed-management-project?lang=en
[72] http://r4d.dfid.gov.uk/Project/60764/

S. No.	Project and Description	Amount (in Million)	Agency
5.	**Indian Himalayas Climate Adaptation Program[73]** The goal of the bilateral cooperation program is that the resilience of the vulnerable communities in the Himalayas is strengthened, and knowledge and capacities of national research institutions and adaptation planning and implementation at the state level are connected and enhanced by facilitating policy dialog between Himalayan states. Time Period: April 2012-March 2015	CHF 3.5	SDC

5. Cross-cutting Areas

Projects under this category, supported through technical capacity development.

S. No.	Project and Description	Amount (in Million)	Agency
1.	**Capacity Building for Addressing Climate Change[74]** To ensure that national climate change policies are modified or adapted to meet the needs of the states, in partnership with the Ministry of Environment and Forests, GoI, this project aims to strengthen capacities of state governments and other stakeholders both nationally, and across the states to address climate change challenges. Time Period:2010-2012	USD 0.25	UNDP
2.	**Strengthening of Madhya Pradesh Climate Change Cell[75]** The project aims to develop MP Climate Change Cell into a knowledge management centre to effectively manage and disseminate knowledge related to climate change Time Period: December 2009 - December 2012	USD 0.36	UNDP
3.	**Institutional Support to Policy Research Organizations in India[76]** It is a multi-donor program dedicated to strengthening independent policy research institutions, or "think tanks," in developing countries, thereby enabling them to produce sound research that both informs and influences policy. This grant will strengthen the ability of the nine research institutions in India to provide, disseminate and communicate high-quality research. It will do so through measures aimed at enhancing the ability of staff to conduct sound research, improving organizational performance and forging links with policymakers. Time Period : 9th January , 2010 – 9th January, 2014	USD 12.64	IDRC

[73] www.swiss-cooperation.admin.ch/india/en/.../resource_en_222538.pdf
[74] http://www.in.undp.org/content/india/en/home/operations/projects/environment_and_energy/capacity_buildingforaddressingclimatechange/
[75] http://www.in.undp.org/content/india/en/home/operations/projects/environment_and_energy/strengthening_madhyapradeshclimatechangecell.html
[76] www.canadainternational.gc.ca/.../whats_new-quoi_de_neuf_20090305_...

S. No.	Project and Description	Amount (in Million)	Agency
4.	**Strengthening Adaptation Capacities and Minimizing Risks of Vulnerable Coastal Communities in India[77]** The project aimed to reduce the vulnerabilities of coastal communities and cities in Tamil Nadu and Andhra Pradesh, India, to climate change and strengthen capacities of local authorities and the population on climate change adaptation, climate change mitigation and disaster risk reduction. Objectives: • Create and implement measures for climate adaptation as well as mitigation and disaster risk reduction in coastal communities, support local authorities in addressing related challenges. • Develop and carry out pilot initiatives on adaptation and mitigation in rural communities (for example, by improving local infrastructure). • Improve capacities and decision making skills of local bodies and communities on adaptation and mitigation and provide advisory services on disaster risk management, create public awareness, improve regional and global visibility of the project and stimulate networking. Time Period: December 2010-December 2013	EUR 0.07	EU
5.	**Climate and Development Fund[78]** To provide improved policies and practices for tackling the impacts of climate change and meeting energy needs for poor people in India and to assist think-tanks to develop analysis innovation and lesson learning during the 12th Five Year Plan (2012-17) period. Time Period: January 8, 2009 -March 31, 2015	£ 0.484	DFID

[77] http://eeas.europa.eu/delegations/india/projects/list_of_projects/220757_en.htm
[78] http://devtracker.dfid.gov.uk/projects/GB-1-114320/

Annex IV

Bilaterally and Multilaterally Funded Mitigation Projects (Grants)

1. Electricity and Energy

Projects in the electricity and energy sector supported by grants.

S. No.	Project and Description	Amount (in Million)	Agency
1.	**Partnership to Advance Clean Energy-Deployment (PACE-D)**[79] The program will contribute to accelerating India's transition to a high performing, low emissions, and energy secure economy. The program has three components: improving end use efficiency; increasing supply of renewable energy; and accelerating deployment of cleaner fossil technologies. Time Period: May 31, 2012-May 30, 2017	USD 19.5	USAID
2.	**Market Development and Promotion of Solar Concentrators-based Process Heat Applications in India**[80] The project, supported by MNRE, GoI, aims to promote and develop a viable and strong market for solar concentrators in India to reduce or replace use of conventional fuels that degrade the environment. Time Period: August 2011 - July 2016	USD 4.4	GEF
3.	**Energy Efficient Commercial Buildings**[81] The project, in partnership with MoEF, aims to reduce energy consumed by large commercial buildings by integrating appropriate design interventions such as lighting, heating, ventilation and air-conditioning systems in buildings. Time Period: October 2010 - September 2014	USD 5.2	GEF

[79] http://map.usaid.gov/PublicProjectDetail?id=a0cd00000033GLSAA2&cid=India
[80] http://www.in.undp.org/content/india/en/home/operations/projects/environment_and_energy/market_developmentandpromotionofsolarconcentratorsbasedprocesshe/
[81] http://www.in.undp.org/content/india/en/home/operations/projects/environment_and_energy/energy_efficiencyimprovementsincommercialbuildings/

S. No.	Project and Description	Amount (in Million)	Agency
4.	**Removal of Barriers to Biomass Power Generation in India, Phase I**[82] The project aimed to accelerate the use of environmentally sustainable biomass power and co-generation technologies in the country and improve electricity supply through renewable energy sources. Time Period: September 2006-March 2014	USD 5.65	GEF
5.	**Access to Energy-enhancing Effectiveness in Electricity Distribution and End-uses (2009-2012)**[83] The project aimed to demonstrate mechanisms for the effective management of electricity at the district and community levels and to support activities to enhance electricity service delivery in the states of Odisha and Chhattisgarh. The project introduced energy efficiency measures (such as CFL) in Gram Panchayats resulting in a 35 percent reduction in electricity consumption from the baseline. Time Period: 2009-2012	USD 1.5	UNDP
6.	**Facility for Low Carbon Technology Deployment**[84] This facility will facilitate and advance technology transfer across sectors, industries, academia and countries to promote energy efficiency and other climate change mitigation measures. It was proposed by the GoI under its comprehensive measures to combat climate change, without compromising the emerging economy growth path to alleviate poverty. Time Period: 7th June 7, 2012 (date of approval)	USD 9	GEF
7.	**Indo-Swiss Program on Building Energy Efficiency, Phase 1**[85] **Indo-Swiss Program on Building Energy Efficiency, Phase 2** The bilateral program focuses on reducing energy consumption in new buildings (residential and public) and promoting best practices in designing and applying energy efficient measures. Time Period: October 2008-December 2012 (Phase 1) December 2012-December 2016 (Phase 2)	CHF 2.1 CHF 4.8	SDC
8.	**Accelerating Use of Biomass for Clean Energy Services**[86] The project goal is to accelerate the diffusion and adoption of biomass-based energy systems (two-stage power gasifier and thermal gasifier) so that the consumers – rural communities and small-scale enterprises – secure access to clean energy services. Time Period: July 2012-June 2015	CHF 2.4	SDC

[82] http://www.in.undp.org/content/india/en/home/operations/projects/environment_and_energy/removal_of_barrierstobiomasspowergenerationinindiaphasei/
[83] http://www.in.undp.org/content/india/en/home/operations/projects/environment_and_energy/access_to_energy-enhancingeffectivenessinelectricitydistribution/
[84] unfccc.int/resource/docs/2014/sbi/eng/inf03.pdf
[85] http://www.sdc.admin.ch/en/Home/Projects/Project_Detail?projectdbID=220907
[86] www.swiss-cooperation.admin.ch/india/en/.../resource_en_222535.pdf

S. No.	Project and Description	Amount (in Million)	Agency
9.	**Partnership to Advance Clean Energy-Research (PACE-R)**[87] The project works to improve energy access and promote low-carbon growth through research and development. Research will focus on transformational scientific and technological cooperation in the areas of building efficiency, solar energy, and advanced biofuels. Time Period: May 31, 2012-May 30, 2017	USD 125	USAID
10.	**Producing Energy from Waste and Sewage** The project was aimed at reducing greenhouse gas (GHG) emissions in the Indian city of Nashik by using sewage and organic waste to produce energy. One of the intentions of the project was to demonstrate a technical solution that is reproducible and financially feasible in densely populated urban areas and is in harmony with the Indian government's climate change targets. Time Period: December 2009-May 2014 Source: http://www.international-climate initiative.com/en/projects/projects/	EUR 2.03	GIZ
11.	**Climate-neutral Energy Supply for Rural Areas** The project was aimed at developing tailor-made and sustainable solutions for rural energy supply that make use of locally available biomass as well as other renewable energy sources. Two pilot projects covering 30 villages were used to develop business models for energy services, made available by the village community. This included the sustainable supply of biomass for power generation, operation and maintenance of the plant and equipment, and distribution and use of the power, along with an appropriate system of payment. Time Period: November 2008-December 2013 Source: http://www.international-climate initiative.com/en/projects/projects/	EUR 4.627	GIZ
12.	**Developing Low-carbon Cities in India: Field Research on Water-carbon Baselines and Low Carbon Strategies in Indian cities**[88] The overall goal of this project was to conduct innovative, interdisciplinary research that facilitates the development of low-carbon cities in India through mitigating GHG emissions while also offering local water efficiency benefits; reducing waste, pollution, and climate vulnerability; and promoting governance for sustainable development. Time Period: January 13, 2013-January 16, 2013	USD 0.15	USAID

[87] http://www.state.gov/r/pa/prs/ps/2011/07/168743.htm
[88] http://map.usaid.gov/PublicProjectDetail?id=a0cd00000033GM9AAM&cid=India

S. No.	Project and Description	Amount (in Million)	Agency
13.	**Biowaste and Algae Knowledge for the Production of Second Generation Biofuels**[89] The project aims to develop an alternative and innovative system for the treatment of biowaste and use of GHG emissions to produce biofuels, using macroalgae as a catalyzer, in a multidisciplinary approach. The objectives of the project are: • production of a cost-efficient biogas without using cereal crops • optimization of production of biogas per amount of biowaste and CO2 used • increase and facilitate the types of biowastes that can be utilized for biogas production Time Period: April 1, 2010-March 31, 2015	EUR 2.90	EU

2. Transport

Projects in the transport sector supported through grants.

S. No.	Project and Description	Amount (in Million)	Agency
1.	**Efficient and Sustainable City Bus Services**[90] Promoting sustainable modes of transport through a more comprehensive focus on city bus transport, the project will support improvements in the policy and regulatory environment and modernization of bus services in selected Indian cities, aimed at making these services more attractive and convenient to personal motor vehicle users and, thereby, lead to a modal shift. Such a modal shift will result in: (i) increased share of energy efficient and low carbon transport usage; (ii) improved energy efficiency in the movement of nonpublic transport traffic due to reduced congestion; and (iii) reduced air pollution, easier access to affordable and efficient transport, and other local issues. Time Period: June 7, 2012 (date of approval)	USD 9.2	GEF

[89] http://setis.ec.europa.eu/energy-research/project/biowaste-and-algae-knowledge-production-2nd-generation-biofuels
[90] http://documents.worldbank.org/curated/en/2014/06/19615614/india-efficient-sustainable-city-bus-services-project

3. Industry

Projects in the industry sector, in the form of grants.

S. No.	Project and Description	Amount (in Million)	Agency
1.	**Up-scaling Energy Efficient Production in Small Scale Steel Industry in India**[91] The project, in partnership with the GoI and supported by AusAid, aims to upscale energy efficient interventions in the steel re-rolling mills sector and other sub-sectors of the small scale steel industry in India. This will enable mitigation of GHG emissions and lead to improvement in productivity. Time Period: June 2013-June 2015	USD 0.95	UNDP
2.	**Energy Conservation in Small Sector Tea Processing Units in South India**[92] The project, in partnership with the Ministry of Commerce, GoI, aimed to introduce energy conservation measures in the firewood intensive tea sector in south India by addressing information, technology and financial barriers that stand in the way of greater adoption of energy conservation technologies and practices. Time Period: 2008-2012	USD 0.975	GEF
3.	**Energy Efficiency in Steel Re-rolling Mills**[93] Steel production is an energy-intensive process that generates a large amount of solid waste and GHGs. In partnership with the Ministry of Steel, GoI, the project aimed to increase energy efficiency of steel re-rolling mills sector, reduce associated emissions and enable penetration of environmentally-sustainable, energy efficient technologies in this sector. Time Period: 2004-2013	USD 6.75	GEF
4.	**Achieving Reduction in GHG Emissions through Advanced Energy Efficiency Technology in Electric Motors**[94] The ability to effectively address acute electricity shortages in India will depend critically on the increased efficiency of electrical appliances. Supported by the BEE, this project aimed to demonstrate greater energy efficiency in one key energy intensive sector – electrical motors. Time Period: 2008-2012	USD 0.25	GEF

[91] http://www.in.undp.org/content/india/en/home/operations/projects/environment_and_energy/upscaling-energy-efficient-production-in-small-scale-steel-indus.html
[92] http://www.in.undp.org/content/india/en/home/operations/projects/environment_and_energy/energy_conservationinsmallsectorteaprocessingunitsinsouthindia/
[93] http://www.in.undp.org/content/india/en/home/ourwork/environmentandenergy/videos/the-power-of-energy-efficiency-transforming-the-indian-steel-re-rolling-sector.html
[94] http://www.in.undp.org/content/india/en/home/operations/projects/environment_and_energy/achieving_reductioninghgemissionsthroughadvancedenergyefficiency/

S. No.	Project and Description	Amount (in Million)	Agency
5.	**Promoting Industrial Energy Efficiency through Energy Management Standard, System Optimization and Technology Incubation**[95] The project will serve the dual objective of promoting energy efficiency by introducing the ISO energy management standard 50001 and integrating system optimization practices in industry; and facilitating formation of technology incubators to catalyze innovation and technology transfer for cross-cutting technologies Time Period: June 7, 2012 (date of approval)	USD 4.54	GEF-United Nations Industrial Development Organization (UNIDO)
6.	**Organic Waste Streams for Industrial Renewable Energy Applications in India**[96] The proposed project focused on using organic waste streams for industrial renewable energy applications in small and medium enterprises (SMEs), in line with the priorities of the GoI, as outlined in the NAPCC and relevant National Missions, including the National Mission for Enhanced Energy Efficiency in Industry , with the overall aim to increase the competitiveness of SMEs and reduce dependency on fossil fuels. Time Period: April 12, 2013	USD 3.33	GEF-UNIDO
7.	**Converting a Production Facility to the Manufacture of Climate-friendly Air-conditioning Equipment** The project assisted an Indian manufacturer of air-conditioning systems in converting to environmentally compatible hydrocarbon refrigerants and energy-efficient technology, thereby establishing a best-practice model. Production and service technicians received training in the safe handling of flammable refrigerants and maintenance of the equipment. The project partners also developed an action plan (including financial instruments and market-based incentives) to promote the market launch of energy-efficient air-conditioning systems that do not use fluorinated GHGs. Time Period: December 2008-May 2013 Source: http://www.international-climate initiative.com/en/projects/projects/	EUR 2.062	GIZ
8.	**Eco-industrial Parks in Andhra Pradesh** The purpose of the project was to support the process of structural change towards improved environmental performance and to break the link between economic growth and resource consumption in India by developing and implementing the concept of eco-industrial parks. The project supported selected existing industrial parks in the planning and implementation of energy and resource-saving measures. It also advised the parks on the introduction of climate, environmental and energy audits and the monitoring of GHG emissions. In addition, decision-makers and experts from the partner organisations and industrial parks receives training in energy and resource efficiency. Time Period: November 2008-December 2010 Source: http://www.international-climate initiative.com/en/projects/projects/	EUR 0.72	GIZ

[95] http://www.thegef.org/gef/sites/thegef.org/files/gef_prj_docs/GEFProjectDocuments/Climate%20Change/India%20-%20(4893)%20-%20Promoting%20industrial%20energy%20efficiency%20through%20ene/India%20GEF-5%20PIF_10April2012%20_2_.pdf

[96] http://www.thegef.org/gef/sites/thegef.org/files/gef_prj_docs/GEFProjectDocuments/Climate%20Change/India%20-%20(5087)%20-%20Organic%20Waste%20Streams%20for%20Industrial%20Renewable%20Ene/2-1-13%20%20PIF%20Organic%20Industrial%20WTE%20Project%20GEF5%2019%20Sep%202012_revised%20agency%20fee%2031Jan2013.pdf

Annex V

Bilaterally and Multilaterally Funded Mitigation Projects (Loans)

1. Electricity and Energy

Projects in this sector supported by loans

S. No.	Project and Description	Amount (in Million)	Agency
1.	**Vishnugad Pipalkoti Hydro Electric Project**[97] The objectives of the roject are: a) to increase the supply of electricity to India's national grid through the addition of renewable, low-carbon energy; and b) strengthen the institutional capacity of the borrower with respect to the preparation and implementation of economically, environmentally and socially sustainable hydropower projects. Time Period: June 30, 2011-December 31, 2017	USD 648	World Bank
2.	**Punjab High Voltage Distribution System**[98] The development objectives of the project for are to: reduce global emissions of carbon dioxide; increase the efficiency, reliability, and quality of electricity supply in the local distribution system of Punjab State Electricity Board. This carbon offset project consists of the purchase of emission reductions generated by reduction in technical and commercial losses achieved by Punjab State Power Corporation Limited through implementation of High Voltage Distribution System for agricultural consumers. Period: September 24, 2010-December 31, 2019	USD 10	World Bank

[97] http://www.worldbank.org/projects/P096124/vishnugad-pipalkoti-hydro-electric-project?lang=en
[98] http://www.worldbank.org/projects/P105618/punjab-high-voltage-distribution-system?lang=en

S. No.	Project and Description	Amount (in Million)	Agency
3.	**Bhakra Beas Management Board Hydro Power Rehab Project - Carbon Finance[99]** The objective of the project is to improve the reliability, efficiency and safety of the operation of Bhakra Beas Management Board's hydraulic structures and generation equipment to meet the increasing demand for power in the Northern Electricity Grid of India through existing clean renewable energy resources. The global environment objective is to reduce the emissions of GHGs by using market-based mechanisms sanctioned under the Kyoto Protocol to support clean energy projects in India. This will be achieved through: (i) the generation of renewable energy which will displace thermal power units, and (ii) the improvement of energy efficiency through the rehabilitation and replacement of existing outdated and inefficient equipment. Time Period: June 1, 2010-December 31, 2018	USD 2.9	World Bank
4.	**Karnataka Wind[100]** The project the involved implementation of a 29.7MW wind power project at two villages in the district of Davangere in Karnataka - Arasinagundi (13.20 MW) and Anabaru (16.50 MW). The development objectives of the project were: • Increase renewable power generation • Reduce global emissions of carbon dioxide The objectives were consistent with the developmental and poverty reduction objectives of the GoI. Time Period: December 24, 2009-December 31, 2013	USD 13.59	World Bank
5.	**Street Lighting Energy Efficiency[101]** The development objectives of the project are: • Contribute to sustainable development by improving energy efficiency of street lighting applications at participating municipalities • Reduce global emissions of carbon dioxide Time Period: December 17, 2009-December 13, 2015	USD 8.12	World Bank
6.	**1) Chiller Energy Efficiency[102]** **2) India -Chiller Energy Efficiency Project - Montreal Protocaol Component** The objective of the project was to reduce GHG emissions whilst simultaneously supporting the completion of the phase-out of consumption of ozone depleting substances required under the Montreal Protocol. There were four components to the project, which involved provision of incentives for investment in energy efficient chillers, technical assistance to support project readiness and sustainability focusing on enhancing the awareness of relevant stakeholders in energy conservation measures, etc. Time Period: June 30, 2009-June 30, 2014	USD 6.3 USD 1	World Bank

[99] http://www.worldbank.org/projects/P105152/bbmb-hydro-power-rehab-project-carbon-finance?lang=en&tab=overview
[100] http://www.worldbank.org/projects/P119295/karnataka-wind?lang=en
[101] http://www.worldbank.org/projects/P107069/street-lighting-energy-efficiency?lang=en
[102] http://www.worldbank.org/projects/P100584/chiller-energy-efficiency?lang=en

S. No.	Project and Description	Amount (in Million)	Agency
7.	**Coal-fired Generation Rehabilitation**[103] The objective of the project is to improve energy efficiency of selected coal-fired power generation units through renovation and modernization and improved operations and maintenance. The global environmental objective of the project is the reduction of GHG emissions through energy efficient rehabilitation of coal-fired power plants. Time Period: June 18, 2009-November 30, 2014	USD 45.4	World Bank
8.	**Rampur Hydropower Project**[104] The development objective of the project is to improve the reliability of India's northern electricity grid through the addition of renewable, low carbon energy from the Rampur hydropower project; and to improve the effectiveness of Satluj Jal Vidyut Nigam Limited with respect to the preparation and safe implementation of economically, environmentally, and socially sustainable hydropower projects. Time Period: September 13, 2007-December 31, 2014	USD 400	World Bank
9.	**Himachal Pradesh Clean Energy Development Investment Program (Facility Concept)**[105] **Himachal Pradesh Clean Energy Development Investment Program Tranche 1** **Himachal Pradesh Clean Energy Development Investment Program Tranche 2** **Himachal Pradesh Clean Energy Development Investment Program Tranche 3** The program combined physical investments in hydroelectric power generation in Himachal Pradesh with nonphysical interventions in capacity development. The main objective was to help fulfill local energy demand. Surplus power generated, particularly due to strong river flows from the spring snow melt, was exported to the northern grid, thus serving as an important source of revenue for the state. Time Period: October 23, 2008-December 8, 2011	USD 800 USD 150 USD 208 USD 60	ADB
10.	**Gujarat Solar Power Transmission Project**[106] The project aimed at developing the transmission infrastructure for evacuation of power in a reliable manner from the solar power generation plants to be located in the 2,500 hectares Charanka solar park in Patan district of Gujarat. The solar park sited over 500 MW of both solar photovoltaic and concentrated solar power plants. Time Period: September 12, 2011	USD 100	ADB
11.	**Solar Photovoltaic Plant Sakri**[107] The 125 MW solar photovoltaic power plant was constructed by MAHAGENCO at Shivajinagar, Sakri, Dhule district, Maharashtra, with the option for further expansion by 25 MW. Time Period: 2011-2012	EUR 250	KfW

[103] http://www.worldbank.org/projects/P100531/coal-fired-generation-rehabilitation?lang=en
[104] http://www.worldbank.org/projects/P095114/rampur-hydropower-project?lang=en
[105] http://www.adb.org/projects/41627-013/main
[106] http://www.adb.org/projects/44431-013/main
[107] http://www.india.diplo.de/Vertretung/indien/en/12__Climate__Development__Cooperation/Energy/Cooperation/Sakri.html

S. No.	Project and Description	Amount (in Million)	Agency
12.	**Energy Projects (14)** In India, about 14 energy sector projects with KfW loan commitments of more than €1.5 billion are currently in various stages of execution in India. The main objective of the German Government is to work together with the Indian Government in facilitating inclusive growth, reducing poverty and meeting the Millennium Development Goals. Time Period: Projects in various stages of Execution as on March 8, 2011 (http://www.india.diplo.de/contentblob/3159058/Daten/1170174/DD_PR_08Mar.pdf)	EUR 1500	KfW
13.	**Promotion of Renewable Energies and Energy Efficiency through the Indian Renewable Energy Development Agency (IREDA)[108]** KfW's fourth line of credit is dedicated to the promotion of new renewable energy and aims to promote innovative renewable energy business models, involving either new technologies, financing mechanisms or institutional arrangements across a variety of renewable energy sources – solar, wind, biomass and cogeneration as well as small hydro. Under this latest and on-going line of credit, five biomass and cogeneration projects (95 MW), four small hydro projects (55 MW) and six photovoltaic projects (15 MW) have been supported up to now. Time Period: March 2011 (date of approval)	EUR 200	KfW
14.	**Promote the Development of Renewable Energy in India[109]** The project provides public financial institution, IREDA, a credit line to refinance loans that the institution agrees to invest in renewable energy-based electricity production. This aims to promote renewable energy projects by independent energy producers by implementing renewable energy technologies (biomass, cogeneration, small-scale hydropower, wind power projects, photovoltaic and solar thermal). Time Period: December 2010-Present	EUR 70	AFD
15.	**Finance Biodigester: Reduce Emissions of GHG Emissions by Improving the Living Conditions of Populations[110]** The objective of this project is to accelerate and achieve larger scale nongovernmental organization programs that contribute to the mitigation of GHG emissions while improving the lives of people who have the access to carbon credit market as an extra source of income. The project will lead to generation of biogas for energy production in rural areas and reduction in deforestation. Time Period: 2009-2021	EUR 0.5	AFD

[108] http://www.india.diplo.de/Vertretung/indien/en/12__Climate__Development__Cooperation/Energy/Cooperation/Renewables__loan.html
[109] http://www.afd.fr/lang/en/home/pays/asie/geo-asie/inde/portfolio/energies-renouvelables-ligne-credit-ireda
[110] http://www.afd.fr/lang/en/home/pays/asie/geo-asie/inde/portfolio/financer-biodig-marche-credits-carbone

S. No.	Project and Description	Amount (in Million)	Agency
16	**ACME Energy Solar Power Generation[111]** ACME Solar Energy is developing a 25 MW grid connected solar photovoltaic power plant in the State of Madhya Pradesh (MP), India. It has entered into a 25-year power purchase agreement with MP Power Management Company and is estimated to supply 50 GWh per year. IFC is providing support to the project through a loan. Time Period: 31st July 2013 (Approval Date)	50 USD	IFC
17.	**SEI Solar Power Pvt. Ltd Solar Power Generation[112]** SunEdison Energy Holding (Singapore) Pte. Ltd and Astronergy Solar Korea Co. Ltd. through their joint venture SEI Solar is developing a 24 MWp solar photovoltaic power project on an 82.5 ha barren area in the Ugras village in the district of Jodhpur, Rajasthan state, India. The total output of the Project will be sold to the state owned power trading company, NTPC Vidyut Vyapar Nigam Ltd under a year 25 PPA signed on January 2012. Time Period: 22nd February 2013 (Approval Date)	12.2 USD	IFC
18.	**Green Infra Limited Solar Power Generation[113]** The Green Infra Limited (GIL) is receiving a loan of 50 USD million from IFC for developing solar power generation plants of capacity 20 MW and 5 MW respectively in Bap village, Jodhpur, Rajasthan, India. Time Period: 21st September 2012 (Approval Date)	50 USD	IFC
19.	**Azure Rooftop Solar Power Generation[114]** Azure Sun Energy Private Limited is entering into the construction of a 2.5 MW rooftop solar power in Gandhinagar, Gujarat. The power generated under the Project will be sold at a pre-agreed tariff to Torrent Power Limited ("TPL"), a privately owned distribution company that holds the license for electricity distribution in Gandhinagar and several other cities in Gujarat. About 80% of the roof top solar panels will be installed on the roofs of government buildings, while the balance 20% will be installed on the roofs of privately owned buildings. Time Period: 11th March 2013 (Approval Date)	4.6 USD	IFC
20.	**Mahindra Solar One Private Ltd[115]** The Mahindra Solar One project involves development of a greenfield 5MW power generation in Rawra village, Jodhpur district, Rajasthan under the National Solar Mission. Time Period: 10th November 2011 (Approval Date)	5.43 USD	IFC

[111] http://ifcextapps.ifc.org/ifcext/spiwebsite1.nsf/78e3b305216fcdba85257a8b0075079d/3a9a882899ef5bfb85257b50006e857c?opendocument
[112] http://ifcextapps.ifc.org/ifcext/spiwebsite1.nsf/78e3b305216fcdba85257a8b0075079d/01ef0b5ea5ed8a6e85257ab8006271ed?opendocument
[113] http://ifcextapps.ifc.org/ifcext/spiwebsite1.nsf/78e3b305216fcdba85257a8b0075079d/6c4fd37b0086222585257a2c0066f60b?opendocument
[114] http://ifcextapps.ifc.org/ifcext/spiwebsite1.nsf/78e3b305216fcdba85257a8b0075079d/8245df2994845eec85257a1d0069d3d7?opendocument
http://www.azurepower.com/project-portfolio.php
[115] http://ifcextapps.ifc.org/ifcext/spiwebsite1.nsf/78e3b305216fcdba85257a8b0075079d/0b5da888fb6abb01852578ea0065b16b?opendocument

S. No.	Project and Description	Amount (in Million)	Agency
21.	**Sun Borne Solar[116]** Sunborne Energy LLC is developing grid interactive independent solar thermal ("CSP") and solar photovoltaic ("SPV") power projects in India. This Sun Borne project involves development of a series of solar thermal projects based on parabolic trough technology under the National Solar Mission scheme of Government of India, starting first with one or two 50MW CSP and one 15 MW SPV projects in the states of Gujarat, Andhra Pradesh and Rajasthan. IFC is participating in this through an investment of US$4.1 million in equity and US$5.9 million in quasi-equity instruments adding to a total of US$ 10 million. Time Period: 29th December 2010 (Approval Date)	10 USD *	IFC
22.	**NDPL Solar[117]** North Delhi Power Limited ("NDPL") is installing grid-interactive rooftop solar power plants of approximately 5.7MW in aggregate across various locations in Delhi. The Project will comprise of about 21 Power Plants of different sizes (ranging from 1 MW to 100 KWs) across different localities in Delhi. Time Period: 18th January 2011 (Approval Date)	15 USD	IFC
23.	**Azure Power Solar Power Generation[118]** The Azure Solar Power Project involves development of 4MW grid connected solar power plant expansion in Awan village, Punjab and a 8MW power plant in Gujarat by the end of 2010. The IFC is extending financial support for the project through a quasi- equity investment of US$ 10 million. Time Period: 2nd February 2010 (Approval Date)	10 USD	IFC
24.	**SEGEF Moser Baer Solar Power Generation[119]** The project involves building of a grid-connected 5MW solar PV demonstration plant, which will be integrated into the grid network in the Sivaganga district, state of Tamil Nadu. The estimated average annual net electricity generation from the 5 MW project is expected to be approximately 8,000 MWh, which corresponds to an Annual PLF of about 18%. The output of the PV demonstration plant will contribute to the peaking power supplies of the adjacent region, within the state of Tamil Nadu, over a twenty-five year period or longer. Time Period:	4 USD	IFC
25.	**Applied Solar Power Generation[120]** The project involves installation of off grid solar power in about 10,000 telecom tower sites in next few years. Applied Solar Technologies uses a combination of solar PV, battery back-up and diesel generator making it a hybrid energy solution that optimizes the usage of various sources through a controller. The optimal usage of these sources results in decreased diesel consumption, increased battery life and reduced diesel generator maintenance and replacement costs resulting in savings for AST's consumers. Time Period: 9th June 2010 (Approval Date)	21 USD *	IFC

[116] http://ifcextapps.ifc.org/ifcext/spiwebsite1.nsf/78e3b305216fcdba85257a8b0075079d/1f3d023a54a46622852577b3004c3fbc?opendocument
[117] http://ifcextapps.ifc.org/ifcext/spiwebsite1.nsf/78e3b305216fcdba85257a8b0075079d/27773d5538f6288c852577a6005ed6fe?opendocument
[118] http://ifcextapps.ifc.org/ifcext/spiwebsite1.nsf/78e3b305216fcdba85257a8b0075079d/28040aa92be3d10c852576ba000e32a7?opendocument
http://ifcextapps.ifc.org/ifcext/spiwebsite1.nsf/78e3b305216fcdba85257a8b0075079d/423623a3b1b96b4e852576ba000e32ac?opendocument
[119] http://ifcextapps.ifc.org/ifcext/spiwebsite1.nsf/78e3b305216fcdba85257a8b0075079d/bd4aeac1c2d6a0a7852576ba000e2daf?opendocument
[120] http://ifcextapps.ifc.org/ifcext/spiwebsite1.nsf/78e3b305216fcdba85257a8b0075079d/670f11511cf18faf8525770c004e213d?opendocument

S. No.	Project and Description	Amount (in Million)	Agency
26.	**DJEPL and UUPPL Wind Renewable Energy Generation[121]** Surajbari Windfarm Development Pvt Ltd (SWDPL) through its two wholly owned subsidiaries, DJ Energy Private Limited and Uttar Urja Projects Private Limited (DJEPL and UUPPL respectively) is developing two wind farms with a combined capacity of 170 MW at Daloda and Piploda taluka in Mandsour and Ratlam district of Madhya Pradesh, India. The project involves procurement, erection, testing, commissioning, operation and maintenance of 85 wind turbines. Time Period: 17th April, 2014 (Approval Date)	50.3 USD	IFC
27.	**NSL Vaspet (40 MW wind) Renewable Energy Generation[122]** The Project involves development of a 40MW wind power plant in Vaspet, Sangli District of Maharashtra by NSL Renewable Power Private Limited through an SPV called Jath Wind Energy Private Limited. The project company has been setup for the sole purpose of construction, operation, and maintenance of the 40 MW project and will not have any other operations. Time Period: 22nd January, 2014 (Approval Date)	15.01USD	IFC
28.	**Bhilwara Captive Renewable Energy Generation[123]** The project involves the development of a 20 MW wind power project in Jaisalmer, Rajasthan Bhilwara Green Energy Limited, under the Group Captive Scheme in India by setting up 10 Wind Turbine Generators (WTGs) of 2MW each in Villages Rajgarh and Bhaisara; Tehsil Pokran in Jaisalmer, Rajasthan. Time Period: 20th March, 2013 (Approval Date)	7.56 USD	IFC
29.	**NSL Wind, Renewable Energy Generation[124]** NSL Renewable Power Private Limited intends to set up a wind power project of 75 MW in Chilarwadi village of Man Tehsil, Satara District of Maharashtra, India through a subsidiary NSL Wind Power Company (Satara) Private Limited. The Project will be implemented in two phases with 25.5 MW to be implemented in the first phase. The Project involves supply, erection, testing, commissioning, operation and maintenance of 50 wind turbines. Time Period: 14th December, 2012 (Approval Date)	18.8 USD	IFC
30.	**Inox Renewables Ltd (IRL), Renewable Energy Generation[125*]** The project involves the construction of upto 400 MW of wind projects in the states of Rajasthan and Gujarat in India. The first of those sites is likely to be the 300MW wind farm at Dangri in Rajasthan. IRL plans to build up to 3000 MW of wind projects by 2017 with the majority being in the states of Rajasthan and Gujarat in India. Time Period: 1st August , 2012 (Approval Date)	115 USD	IFC

[121] http://ifcextapps.ifc.org/ifcext/spiwebsite1.nsf/78e3b305216fcdba85257a8b0075079d/2a8f5773b396d44285257c9b005497f1?opendocument
[122] http://ifcextapps.ifc.org/ifcext/spiwebsite1.nsf/78e3b305216fcdba85257a8b0075079d/03e3e28793f424d485257c40006e39f8?opendocument
[123] http://ifcextapps.ifc.org/ifcext/spiwebsite1.nsf/78e3b305216fcdba85257a8b0075079d/37996c50a8af108f85257afe006ba22f?opendocument
[124] http://ifcextapps.ifc.org/ifcext/spiwebsite1.nsf/78e3b305216fcdba85257a8b0075079d/96c66971d1af937085257a72005a048d?opendocument
[125*] http://ifcextapps.ifc.org/ifcext/spiwebsite1.nsf/78e3b305216fcdba85257a8b0075079d/c73404636ccc56bd852579ea0069f7bb?opendocument

S. No.	Project and Description	Amount (in Million)	Agency
31.	**Shalivahana Green Energy Ltd, Biomass Power Generation**[126*] The Project involves the development of 23 MW biomass power projects each in Sundergarh, Orissa and Ranchi, Jharkhand. Time Period: 20th May, 2011 (Date of Approval)	30 USD	IFC
32.	**Husk Power Systems Inc. (HPS), Biomass Power Generation**[127*] IFC is providing finance to HPS's expansion plan by provision of off-grid power using biomass by setting up HPS plants across villages in the states of Bihar and Uttar Pradesh. Currently, the Company has about 25 plants spread across the state of Bihar in India. HPS uses its own proprietary technology to install and operate 35-100 kW "mini power plants" that delivers electricity as a "pay-for-use" service using a point-to-point system that connects each household or business directly to the HPS power station. Time Period: 8th June, 2010 (Date of Approval)	1.25 USD	IFC
33.	**Auro Mira Bio Systems Kanyakumari Private Limited, Biomass Power Generation**[128] The Project involves the construction and operation of 15 MW biomass power plant near Kanyakumari district of Tamil Nadu. The Project would use agriculture residues, wastes and fuel from waste land (such as juliflora) - which has no other competing use. The power produced at this plant would be sold to the grid through a power purchase agreement or to private buyers through merchant power trading companies. Time Period: 23rd December, 2009 (Approval Date)	6.21 USD	IFC

Total Amount Disbursed: USD 426.36 Million

NOTE: - The amount with an (*) has been derived by adding the 'loan' and the 'equity' amount.

[126*] http://ifcextapps.ifc.org/ifcext/spiwebsite1.nsf/78e3b305216fcdba85257a8b0075079d/755ea6c8c0b01c9b85257846006e47d2?opendocument

[127*] http://ifcextapps.ifc.org/ifcext/spiwebsite1.nsf/78e3b305216fcdba85257a8b0075079d/3253b5cd9b3ec9a3852576ff0067bd7b?opendocument

[128] http://ifcextapps.ifc.org/ifcext/spiwebsite1.nsf/78e3b305216fcdba85257a8b0075079d/24e0de505f9fd31c852576ba000e2e02?opendocument

2. Transport

Projects supported by loans in in the transport sector

S. No.	Project and Description	Amount (in Million)	Agency
1.	**Jaipur Metro Rail Line 1-Phase B Project**[129] In January 2010, the Government of Rajasthan established the Jaipur Metro Rail Corporation as a special purpose vehicle to implement the metro rail lines. Line 1-Phase A (9.7 km elevated portion from Mansarovar to Chandpole), at a cost about USD 400 million and financed entirely by the government, began commercial operation in late 2013. The proposed ADB loan is to help finance Line 1-Phase B, consisting of the 2.3 km underground portion from Chandpole to Badi Chopar, with two stations for completion and operation by early 2018. The project is consistent with the country's development goal of achieving faster, more inclusive and sustainable growth. It is well aligned with the National Urban Transport Policy to address mobility challenges and improve the quality of life in the urban cities of India. Time Period: November 20, 2013	USD 176	ADB
2.	**Sustainable Urban Transport Project**[130] The objective of the project is to promote environmentally sustainable urban transport in India and to improve the usage of environment-friendly transport modes through demonstration projects in selected cities. This restructuring, involves four components. The first is the cancellation of the Pune City Demonstration Project under Component 2 of the project and reallocation of the GEF+ International Bank for Reconstruction and Development funds from Pune, Government of Maharashtra, to Hubli-Dharwad, Government of Karnataka, a new city being inducted into the project. The second is the cancellation of other works and goods associated with implementation of the bus rapid transit system in Pimpri-Chinchwad, Government of Maharashtra (under sub-component (3b) and goods under subcomponent (3) of Part 2B of the project), with reallocation to Hubli-Dharwad, Government of Karnataka. The third is an increase in the financing percentage for consultants' services and training under Part I of the project on capacity development assistance for urban transport (Component IB) in the GEF Grant Agreement from 91 to 100 percent. Time Period: December 10, 2009-November 30, 2015	USD 105.23	World Bank

[129] http://www.adb.org/projects/46417-001/main
[130] http://www.worldbank.org/projects/P110371/sustainable-urban-transport-project?lang=en

3. Industry

S. No.	Project and Description	Amount (in Million)	Agency
1.	**Improve the Energy Efficiency of Indian Micro, Small and Medium Enterprises (MSMEs)[131]** This project allowed the Small Industries Development Bank of India (SIDBI) to promote access to credit for SMEs through investments energy officials, primarily through direct loans, but also through lines granted to commercial banks. More specifically, the project aimed to: • Support business in the implementation of actions leading to reduce specific fuel consumption (energy consumed per unit of production) and limit their emissions of GHGs without limiting their growth; • Encourage businesses to identify and implement actions aimed at the use of renewable energy; • Develop expertise and necessary in the promotion of energy efficiency in SIDBI and facilitate the dissemination of these practices from other partner banks instruments. Time Period: December 2009	EUR 50	AFD

4. Cross-cutting Areas

S. No.	Project and Description	Amount (in Million)	Agency
1.	**Carbon Financing for Improved Rural Livelihoods Project[132]** The 'an Afforestation Project under Clean Development Mechanism project' will mobilize and encourage resource poor farmers to raise plantations of tree species with high rates of carbon removal in their farmlands. The project activity will also help explore and demonstrate the technical and methodological approaches related to a credible carbon removal process. This will be a pilot initiative that aims at improving rural livelihoods through "carbon sequestration" by adopting environment-friendly technologies based on agro-forestry practices. Time Period: May 8, 2007-December 31, 2018	USD 1	World Bank

[131] http://www.adb.org/projects/46417-001/main
[132] http://www.worldbank.org/projects/P110371/sustainable-urban-transport-project?lang=en

Annex VI

Bilateral and Multilaterally Technical Assistance Projects for Mitigation

1. Electricity and Energy

Technical assistance projects in in the electricity and energy sector.

S. No.	Project and Description	Amount (in Million)	Agency
1.	**Development of the International Center for Application of Solar Energy Technologies[133]** The program will help the Indian Institute of Technology–Rajasthan and other agencies, for example, the state government of Gujarat, to institutionalize and operationalize solar energy and smart-grid development functions. It will support knowledge institutions in capacity development, research and development, technology transfer and deployment, knowledge sharing, and pilot testing in solar thermal and solar photovoltaic energy, hybrid solar energy, smart grids, and thermal-to-cooling and thermal-to-thermal technologies. It complements the recently approved ADB technical assistance for capacity building for commercial bank lending for solar energy projects in India. Time Period: May 17, 2011 (date of approval)	USD 200	ADB
2.	**Rajasthan Renewable Energy Transmission Investment Program (Facility Concept)[134]** **Rajasthan Renewable Energy Transmission Investment Program - Tranche 1** The project aimed at expanding the bulk power transmission system in Rajasthan and developing the institutional capacity for renewable energy parks and transmission system in the state. The program supported transmission facilities for evacuation of renewable energy to the state and national grid. The impact of the project was accelerated development of renewable energy sources in Rajasthan and India. Time Period: September 26, 2013 (Facility Concept) October 22, 2013 (Tranche 1)	USD 300 USD 62	ADB

[133] http://www.adb.org/projects/documents/development-international-center-application-solar-energy-technologies-tar
[134] http://www.adb.org/projects/45224-002/main

S. No.	Project and Description	Amount (in Million)	Agency
3.	**Concentrated Solar Power Project**[135] A project preparatory technical assistance was required to support MNRE and Solar Energy Corporation of India Limited to structure the Concentrated Solar Power Project and carry out required project due diligence on technical, economic, financial, legal and safeguard aspects. The assistance will also assess and review the capacity requirements of the Solar Energy Corporation to facilitate and monitor implementation of concentrated solar power sub-projects. Time Period: September 20, 2012 (date of approval)	USD 1	ADB
4.	**Support to Jawaharlal Nehru National Solar Mission**[136] The project aimed to support capacity development of MNRE to take forward the pilot projects proposed under the Jawaharlal Nehru National Solar Mission. It also aimed to strengthen the capacity of MNRE and other relevant institutions in developing new solar power technologies impact. The impact of the project was the development of solar power technologies to support energy security and low carbon energy development. Time Period: November 18, 2011	USD 225	ADB
5.	**Clean Energy Finance Investment Program**[137] The Program is a multi-tranche financing facility in the nature of a financial institution loan with sovereign guarantee by India, which will support IREDA to obtain longer tenor funds for on-lending to sub-borrowers for renewable energy and energy efficiency projects for up to 15 years. This program will support IREDA in financing such projects which are otherwise eligible for ADB financing, but would not be directly financed due to their smaller sizes ranging between USD 5 million to USD 15 million. Outputs will include a large number of investment subprojects for generation of renewable energy using sources such as wind, biomass, hydro, solar, and cogeneration, and projects for improving demand-side energy efficiency. Time Period: May 9, 2013 (date of approval)	USD 225	ADB
6.	**Gujarat Solar and Smart Grid Development Investment Program**[138] The Program will be a multi tranche financing facility to develop the transmission and distribution network in Gujarat. Support will be provided for grid connected solar photovoltaic to meet day time demand in rural areas (including agriculture) and for distribution of electricity through smart high voltage distribution system in two distribution companies. In addition, transmission evacuation and grid stabilization related infrastructure, including for solar power transmission, would be developed Time Period: March 5, 2012 (date of approval)	USD 350	ADB

[135] http://www.adb.org/projects/45225-002/main
[136] http://www.adb.org/projects/45380-001/main
[137] http://www.adb.org/projects/46268-005/main
[138] http://www.adb.org/projects/45418-001/main

S. No.	Project and Description	Amount (in Million)	Agency
7.	**Energy Efficiency Technology Commercialization and Innovation[139]** This program was implemented through four phases: consultations to understand the India regulatory and business environment that may impact shale gas; prepare a comprehensive report on the regulatory and fiscal regime for India and outline recommendations to encourage foreign investment in exploration and production of shale gas; organize a seminar in India to discuss the report; and respond to specific needs of the GoI, such as assistance with drafting regulations and creating financials models. Time Period: June 1, 2011-June 30, 2012	USD 0.3	USAID
8.	**South Asia Regional Initiative for Energy Integration[140]** The program promotes energy security in South Asia through three activity areas: (1) cross border energy trade (2) energy markets (3) clean energy access Through these activities it promotes more efficient regional energy resource utilization, works toward transparent and profitable energy practices, mitigates the environmental impacts of energy production and increases regional access to energy. The program will catalyze enabling systemic conditions for regional energy integration through formation and support to three task forces focusing on the following three components: harmonization of policy, legal, and regulatory mechanisms; advancement of transmission systems interconnections; and establishment of South Asia regional electricity markets. The program covers the following eight countries of the region: Afghanistan, Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan, and Sri Lanka. The project has national coverage; however, its activities may not cover all states. Time Period: October 1, 2012-Septemeber 30, 2017	USD 9.17	USAID
9.	**Access to Clean Energy[141]** The project, in partnership with MNRE, GoI, aimed to enhance access to clean and renewable energy for livelihoods in remote un-electrified villages in the selected seven United Nations Development Assistance Framework states of India. The project aimed to enhance access of rural livelihoods to clean and renewable energy in remote un-electrified villages of the states. This included ilot initiatives chosen to demonstrate as business models for further up-scaling, market development for renewable energy technology products and promotion of livelihood activities Time Period: 2009-2012	USD 2	UNDP

[139] http://map.usaid.gov/PublicProjectDetail?id=a0cd0000000avj4AAA&cid=India
[140] http://map.usaid.gov/PublicProjectDetail?id=a0cd00000033GLXAA2&cid=India
[141] http://www.in.undp.org/content/india/en/home/operations/projects/environment_and_energy/access_to_clean_energy/

S. No.	Project and Description	Amount (in Million)	Agency
10.	**Transforming and Strengthening the Global Solar Water Heating Market[142]** As part of a six-country global project across Albania, Algeria, Chile, India, Lebanon and Mexico, the India project referred to as the global solar water heating project, was started in December 2008. It aimed to accelerate the transformation of the solar water heating market through creating awareness on technologies; providing quality assurance by helping set standards and specifications; demonstrating innovative investment methods; building the needed capacities in the supply chain; and helping establish a supportive regulatory environment. Time Period: 2008-2013	USD 0.08 (approximate figure for India out of six countries)	GEF
11.	**Promoting Business Models for Increasing Penetration and Scaling up of Solar Energy[143]** The project's goal was the promotion of solar energy based heating and cooling applications in selected industrial sectors by developing business models to reduce GHG emissions. It thus promoted the deployment of low-carbon technologies in developing countries by putting together bankable projects and helping the market transform towards a larger absorption of new and innovative technologies that have the capacity to generate global environmental benefits. Time Period: February 29, 2012 (date of approval)	USD 4.36	GEF
12.	**Green Energy Corridors[144]** With an intention to foster the increased use of renewable energy in India through technical as well as financial cooperation, the Government of Germany and GoI expressed their intention to support the evacuation of renewable energy by strengthening the power transmission infrastructure in India. The integration of these power plants in the transmission network was a critical prerequisite for ensuring an environmentally more sustainable energy supply in India. The integration required transmission infrastructure for the evacuation of power as identified in the comprehensive transmission plan called "Green Energy Corridors" prepared by POWERGRID Corporation of India in 2012. Time Period: 2013	EUR 1000	KfW

[142] www.thegef.org/.../Global_Solar_Water_Heating_mkt_07-01%2008.pdf
[143] www.thegef.org/...%20Promoting%20Business%20Models%20for%20India
[144] http://www.india.diplo.de/Vertretung/indien/en/12__Climate__Development__Cooperation/Energy/Cooperation/Green__Corridor.html

S. No.	Project and Description	Amount (in Million)	Agency
13.	**Energy Efficient Housing (National Housing boad) - Setting Standards as in Germany[145]** KfW initiated, in 2010, a collaboration between the Fraunhofer Institute for Building Physics and The Energy and Resource Institute in New Delhi to adapt an existing German calculation model for the energy assessment of buildings to the conditions in India. This research partnership was launched in 2010 and featured as a task force in the Indo-German Energy Forum, which was sponsored by various German and Indian ministries. The methodological basics of the tool, which is now being used on the subcontinent as well, are already established in Europe and have contributed to standardizing the energy accounting of buildings within the EU. The tool (www.ittoolkitindia.com) calculates the energy need of a building as a whole and the potential savings offered by active and passive energy efficiency measures based on the building design. The National Housing Bank channels the funds to commercial banks which provide loans for energy efficient homes. Time Period: 2010	EUR 50	KfW
14.	**Enhancing Capacity For Low Emissions Development Strategies[146]** The project aims to enhance GoI's planning and implementation of GHG mitigation programs to help GoI meet its goal of reducing the carbon 'intensity' of the Indian economy by 25 percent over 2005 levels by 2020; and advance Indian and U.S. capacity to develop long-term plans and strategies for low carbon inclusive growth through the exchange of knowledge and technical expertise. Time Period: Phase 1-January 2010 - January 2013 Phase 2-May 7, 2013-September 30, 2015	1.459 EUR (Phase 1) USD 1(Phase 2)	USAID
15.	**Program to Fund Research Cooperation in Innovative Climate Technology** The project aims to deepen German-Indian research cooperation and disseminate knowledge about solar thermal electricity generation and concentrated photovoltaics . To this end, testing and measurement equipment, calculation tools, a 64 kilowatt concentrated photovoltaic system and a thermal energy storage facility are being installed for research purposes together with NTPC Ltd., India's largest power company. Employees of the NTPC Energy Technology Research Alliance are being trained in the new technologies and methods in cooperation with two German research institutions. Overall, the project will strengthen applied research and technology transfer activities, and enhance the practical application of research findings in specific measures. Time Period: September 2013-December 2016 Source: http://www.international-climate initiative.com/en/projects/projects/	EUR 5	KfW

[145] apuhf.info/KFW-Scanned-Doc.pdf
[146] http://map.usaid.gov/PublicProjectDetail?id=a0cd00000033GM9AAM&cid=India

S. No.	Project and Description	Amount (in Million)	Agency
16.	**Climate Projection and Distributed Energy Supply - Indo-German Energy Forum** The purpose of the project was to support bilateral energy-policy collaboration in the context of the Indo-German Energy Forum through specific cooperative activities. This support focused on promoting the exchange of ideas and information on these activities and on technological cooperation, with the aim of shaping sustainable energy policy. The project actively promoted economic cooperation between German and Indian industrial enterprises so as to provide a stimulus for investment in energy efficiency measures and renewable energy sources. Time Period: December 2008-February 2011 Source: http://www.international-climate initiative.com/en/projects/projects/	EUR 1.256	GIZ
17.	**Excellence Enhancing Centre – India** The project is setting up the Excellence Enhancement Centre, an independent sector platform. The Centre aims to create greater awareness of energy efficiency in the Indian power sector by encouraging the exchange of ideas and experience, providing examples of best practice and facilitating technology transfer. The long-term goal is to establish more efficient power and heating plants and to introduce modern plant operation and management methods in the Indian power sector. Time Period: December 2009-December 2014 Source: http://www.international-climate initiative.com/en/projects/projects/	EUR 1.731	GIZ
18.	**Indo-German Trigen Project** The project's aim is to reduce GHG emissions through the deployment of efficient trigeneration systems and to demonstrate the economic and technical viability of trigeneration technology to potential users by means of a pilot plant. A website provides interested parties with information about the technology and suppliers. In addition, the project evaluates further potential site, informs suppliers about market opportunities and is developing an action plan to help create an enabling environment for trigeneration. Time Period: December 2008-November 2014 Source: http://www.international-climate initiative.com/en/projects/projects/	EUR 1.156	GIZ
19.	**Marketing Solar Energy in Urban Regions and Industrial Zones in India** The project supported the development and demonstration of innovative business models for commercializing solar energy in both urban and industrial zones. To this end, it developed a strategy for marketing solar energy and supporting the implementation of the National Solar Mission, which aims to install solar power plants, generating an output of 20,000 MW by 2020. Activities included feasibility studies, technology transfer, information campaigns and comprehensive capacity building for the project partners. Time Period: December 2009-December 2013 Source: http://www.international-climate initiative.com/en/projects/projects/	EUR 4.9	GIZ

S. No.	Project and Description	Amount (in Million)	Agency
20.	**Solar Mapping And Monitoring** The project created an enabling environment for solar power plant planning and implementation, and to optimize the profits from solar plants in India. To support this process, a country-wide solar measurement and monitoring program was established to provide reliable data on solar irradiation and monitor the efficiency of solar plants currently in operation. Time Period: November 2010-February 2014 Source: http://www.international-climate initiative.com/en/projects/projects/	EUR 1.6	GIZ

2. Transport

Projects in the transport sector supported by technical assistance.

S. No.	Project and Description	Amount (in Million)	Agency
1.	**Sustainable Urban Transport Programme**[147] The project, in partnership with the Ministry of Urban Development, GoI, aims to strengthen capacities of government agencies national/state urban transport departments, municipal corporations and transport experts engaged in urban transport planning and regulations to reduce urban transport emissions causing environmental damage. The project will also demonstrate sustainable urban transport models in 10 cities in the country. Time Period: 2009-2013	USD 23.07	GEF

3. Industry:

The following is a description of the projects in the Industry Sector supported through technical assistance:

S. No.	The Project and Description	Amount (in Million)	Agency
1.	**Enhancing Readiness of the Railway Sector Investment Program as a CDM Project**[148] The capacity development technical assistance is aimed at preparing documents and studies that will enable Indian Railway projects to apply to UNFCCC as a CDM project. It will increase the capacity of the existing rail network to handle traffic demand necessary to sustain the country's economic growth by an increase on accounting reform. This will: (i) reduce fuel consumption and enhance energy efficiency; (ii) improve the environment and reduce pollution; (iii) enhance railway safety, enabling railway users to benefit from lower transport costs; (iv) increase line capacity, benefitting consumers, and producers of goods and services through the provision of timely and efficient transport services and lower logistics costs; and (v) improve staff productivity Time Period: March 21, 2012 (date of approval)	USD 0.3	ADB

[147] http://www.in.undp.org/content/india/en/home/operations/projects/environment_and_energy/sustainable_urbantransportprogramme/
[148] http://www.in.undp.org/content/india/en/home/operations/projects/environment_and_energy/improving_energyefficiencyintheindianrailwaysystem/

S. No.	The Project and Description	Amount (in Million)	Agency
2.	**Energy Efficiency Improvements in Indian Brick Industry[149]** This program aimed to reduce energy consumption and promote energy efficient measures to reduce GHG emissions in the Indian brick industry by: enhancing public sector awareness on resource efficient products; facilitating project finance access to brick kiln entrepreneurs; developing knowledge on technology and marketing; improving availability of efficient technology models in five clusters; enhancing the capacity of brick kiln enterprises. Time Period: April 1, 2009-December 31,2013	USD 0.69	GEF
3.	**Improving Energy Efficiency in Indian Railways System[150]** The project supported efforts to improve energy efficiency in the Indian Railways, which accounts for roughly 2.5 percent of the total electricity consumption in India. The focus was on institutional capacity development, technical training, implementation of energy-efficient technologies and sharing knowledge on best practices. Time Period: September 2011-December 2017	USD 5.2	GEF
4.	**Sustainable Industrialization: Building Stakeholder Capacities and Involvement[151]** The project, in partnership with MNRE, GoI, aimed to influence industries to voluntarily improve their environmental performance, strengthen regulatory systems and increase community engagement in local industrialization processes. The project enabled an understanding of GHG emission profiles of key emitting sectors and engines of industrialization as well asraining of regulators, increased awareness among civil society groups on environmental clearance processes, impacts of mining and thermal power plants Time Period: 2007-2013	USD 0.75	UNDP
5.	**Partial Risk Sharing Facility for Energy Efficiency[152]** Aimed at the development of performance contracting industry in energy efficiency in India, through partial risk sharing with commercial lenders, this project works with several types of entities to enhance the capacities of banks, developers and project promoters. The main aim of the project is to improve the access of finance for promoters of small to medium sized low carbon projects. Time Period: June 7, 2012 (date of appoval)	USD 18	GEF

[149] www.undp.org/.../india/.../energy_efficiency_improvements_in_the_india
[150] http://www.in.undp.org/content/india/en/home/operations/projects/environment_and_energy/improving_energyefficiencyintheindianrailwaysystem/
[151] http://www.in.undp.org/content/india/en/home/operations/projects/environment_and_energy/sustainable_industrialization-buildingstakeholdercapacityandinvo/
[152] http://www.worldbank.org/projects/P128921/partial-risk-sharing-facility-energy-efficiency?lang=en

S. No.	The Project and Description	Amount (in Million)	Agency
6.	**Promoting Energy Efficiency and Renewable Energy in Selected Micro, Small and Medium Enterprise Clusters in India - under the Programmatic Framework for Energy Efficiency[153]** The aim of the project is to develop and promote a market environment for introducing energy efficiencies and enhanced use of renewable energy technologies in process applications in 12 selected energy-intensive clusters in India with expansion to more clusters later, in order to improve the productivity and competitiveness of units as well as to reduce overall carbon emissions and improve the local environment. The project will work at cluster levels as well as policy level to achieve its aim. Time Period: January 27, 2009 (date of approval)	USD 7.172	GEF-UNIDO
7.	**Cleantech Program for SMEs in India[154]** The project aims at promoting clean energy technology innovations and entrepreneurship in selected SMEs in India through cleantech innovation platform and entrepreneurship acceleration programme. Time Period: January 24 2013	USD 1	GEF
8.	**Resources, GHG Emissions, Technology and Work in Production and Distribution Systems: Rice in India[155]** Uniting life-cycle analysis (from environmental science) with value chain/ production system analysis (from management science and economics) and decent work criteria (from labor studies), the project explores how capital, technology and labor are combined to produce commodities and GHGs. Multi-criteria analysis will then explore the costs and incommensurable trade-offs of technology lowering GHGs and improving livelihoods. CO2 (and possibly water) are chosen as indicators of materiality. Time Period: October 1, 2011 (date of approval)	£1.5	DFID
9.	**Scaling up Energy Efficient Technologies in MSMEs[156]** The project aims at enhancing energy efficiency in the MSME sector by providing directions and support to national and state level initiatives for the uptake of energy efficient technologies. Time Period: Previous Phases - November 1993-December 2012 Current Phase - Planning	CHF 15.5 (Previous phase) CHF 1.5 (Current Phase)	SDC
10.	**India - Financing Energy Efficiency at SMEs[157]** The objective of the project is to increase demand for energy efficiency investments in target MSME clusters and to build their capacity to access commercial finance. This includes activities to build capacity and awareness for energy efficiency, activities to increase investment in energy efficiency and knowledge management on the provision of resources and manpower for broad GEF program evaluation and analysis of cross-cutting energy efficiency issues with the goal of ensuring effective implementation and replication of not just this individual project, but of BEE's entire GEF-funded programmatic effort. Time Period: May 27, 2010-December 31, 2014	USD 11.3	World Bank

[153] www.thegef.org/.../India%20...%20Promoting%20Energy%20Efficiency
[154] http://www.thegef.org/gef/cleantech
[155] http://r4d.dfid.gov.uk/Project/60955/
[156] www.swiss-cooperation.admin.ch/india/en/.../resource_en_222539.pdf
[157] http://www.worldbank.org/projects/P100530/india-financing-energy-efficiency-smes?lang=en

4. Cross-cutting Areas

S. No.	Project and Description	Amount (in Million)	Agency
1.	**Low Carbon Campaign for XIX Commonwealth Games 2010 Delhi, India**[158] The project, in partnership with the Commonweath Games Organizing Committee, aimed to use XIX Commonwealth Games as an opportunity to raise awareness on low-carbon practices among athletes, visitors, media and other participants. Time Period: 2010-2011	USD 0.95	GEF
2.	**Development and Management of NAMAs in India** The project aims at supporting MoEF with the coordination and implementation of the response to climate change in the context of two NAMAs and the respective MRV, intending wide scale impacts and international co-financing. Time Period: September 2013-August 2017 Source: http://www.international-climate initiative.com/en/projects/projects/	EUR 3	GIZ

[158] http://www.in.undp.org/content/india/en/home/operations/projects/environment_and_energy/low_carbon_campaignforxixcommonwealthgames2010delhiindia.html