

Climate Change and Sustainable Development

08 CHAPTER

The year 2015 is likely to be momentous with the world set to witness new agreements on climate change and sustainable development. The global agreement on climate change under the UN Framework Convention on Climate Change applicable to all countries must be ambitious, comprehensive, equitable, and balanced, taking into account the huge development needs of developing countries including access to financial resources and low carbon technological options. In India, landmark environmental measures introduced in recent years reflecting actions both at national and sub-national levels are being further supplemented by policies in the light of new scientific findings and current needs.

8.2 The course for international development and environmental policy agenda for the global community for the next fifteen years is being decided in the year 2015. The negotiations under the United Nations Framework Convention on Climate Change (UNFCCC) are expected to result in a global agreement by December 2015, applicable to all countries, to take action on climate change from 2020. Simultaneously, governments are due to agree on a new post 2015 development agenda including a set of Sustainable Development Goals (SDGs), replacing the Millennium Development Goals, which are coming to an end in 2015.

8.3 A major development attracting attention worldwide has been the Joint Announcement on Climate Change by the United States and China—the world's two largest emitters—in November 2014. As per this announcement, the US intends to achieve an economy-wide target of reducing its emissions by 26-28 per cent below its 2005 level in 2025 and to make best efforts to reduce its emissions by 28 per cent. China intends to achieve the peaking of carbon dioxide (CO₂)

emissions around 2030 and to make best efforts to peak early and intends to increase the share of non-fossil fuels in primary energy consumption to around 20 per cent by 2030. This has great political significance in the run-up to the post 2015 climate change agreement. The announcement is expected to provide a boost to the renewable energy sector globally.

8.4 Domestically, several measures have been taken to address climate change. Most importantly, India's national solar mission is being scaled up fivefold from 20,000 megawatts (MW) to 100,000 MW and the clean energy cess on coal has been doubled to ₹100/tonne in 2014.

CLIMATE CHANGE

Recent Scientific Findings from IPCC Fifth Assessment Report

8.5 The Intergovernmental Panel on Climate Change (IPCC) reviews and assesses the most recent scientific, technical, and socio-economic information produced worldwide relevant to climate change. The IPCC in its recent report—

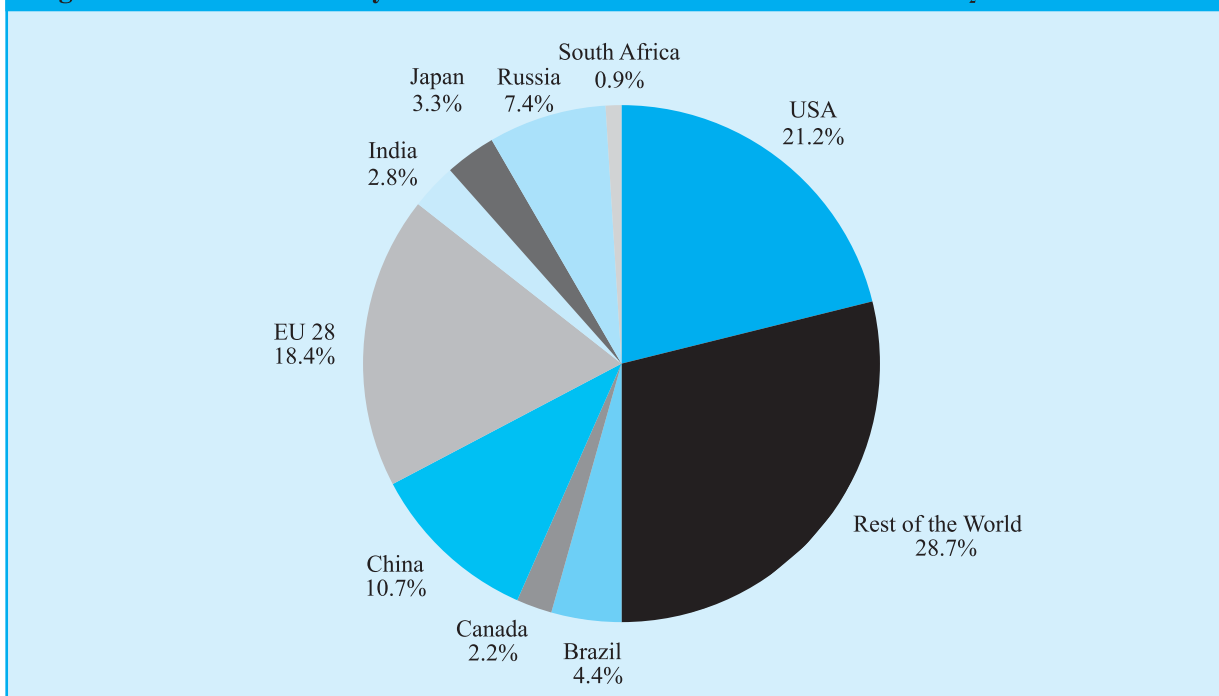
Fifth Assessment Report (AR5)—published in 2014 has observed that there has been an increasing trend in the anthropogenic emissions of greenhouse gases (GHG) since the advent of the industrial revolution, with about half of the anthropogenic CO₂ emissions during this period occurring in the last forty years. The period 1983-2012 is likely to have been the warmest thirty-year period of the last 1400 years. CO₂ emissions from fossil fuel combustion and industrial processes have contributed a major portion of total GHG emissions during the period 1970 - 2010.

8.6 The change in the climate system is likely to have adverse impact on the economy, livelihoods, cropping pattern, and food security. According to the various projections by the IPCC, extreme heat events are likely to be longer and more intense in addition to changes in precipitation patterns. The change in climate could affect the production of wheat, rice, and maize in the tropical and temperate zones; have negative impact on health by exacerbating health problems that already exist especially in developing countries; and adversely impact productive activities like growing food and working outdoors.

8.7 The ecological overshoot problem, i.e. the ecological footprint being larger than the biocapacity of the population, is an important issue in the global climate discourse. The 'overshoot' can also be understood in terms of the carbon budget. The risk of climate change is largely a function of total cumulative GHGs in the atmosphere. IPCC AR5 has estimated that for temperature increase to remain below 2°C of pre-industrial levels the world can emit only about 2,900 Giga tonnes (Gt) of CO₂ from all sources from the industrial revolution till 2100. Till 2011, the world has emitted 1,900 Gt of CO₂, thus already consuming around two-thirds of this budget. This means that out of the budget of 2,900 Gt, only 1,000 Gt remains to be used between now and 2100. The World Resources Institute estimates that if emissions continue unabated, the remaining budget will last only 30 more years.

8.8 The key issue therefore for designing emission reduction commitment is how we should allocate this remaining sparse carbon budget between countries in a manner which is both fair and achievable. This certainly should involve an assessment of historic responsibility based on how

Figure 8.1: Contribution by Different Countries to Cumulative Global CO₂



Source : Centre for Science and Environment and IPCC AR5.

countries have contributed to cumulative emissions so far. India's contribution to cumulative global CO₂ (1850-2011) was a meagre 3 per cent as against 21 per cent by the USA and 18 per cent by the EU (Figure 8.1). The sustainability of the world economic system also needs to be analysed through the lens of social justice and equity. For developing countries, their future commitment will also be determined by what kind and level of financial, capacity-building, and other support is provided by developed countries that have contributed most to cumulative global GHG emissions so far.

8.9 There are multiple mitigation pathways that are likely to limit warming to below 2°C relative to pre-industrial levels. These pathways would require substantial emissions reduction over the next few decades and near zero emissions of CO₂ and other long-lived GHGs by the end of the century. Implementing such reductions poses substantial technological, economic, social, and institutional challenges.

Global GHG Emissions from Major Sectors and Countries

8.10 Since 2000 GHG emissions have been growing in all sectors, except agriculture, forestry, and other land use (AFOLU). Of the 49 (±4.5) GtCO₂eq (CO₂ equivalent) emissions in 2010,

35 per cent were released in the energy supply sector, 24 per cent in AFOLU, 21 per cent in industry, 14 per cent in transport, and 6.4 per cent in buildings (Figure 8.2).

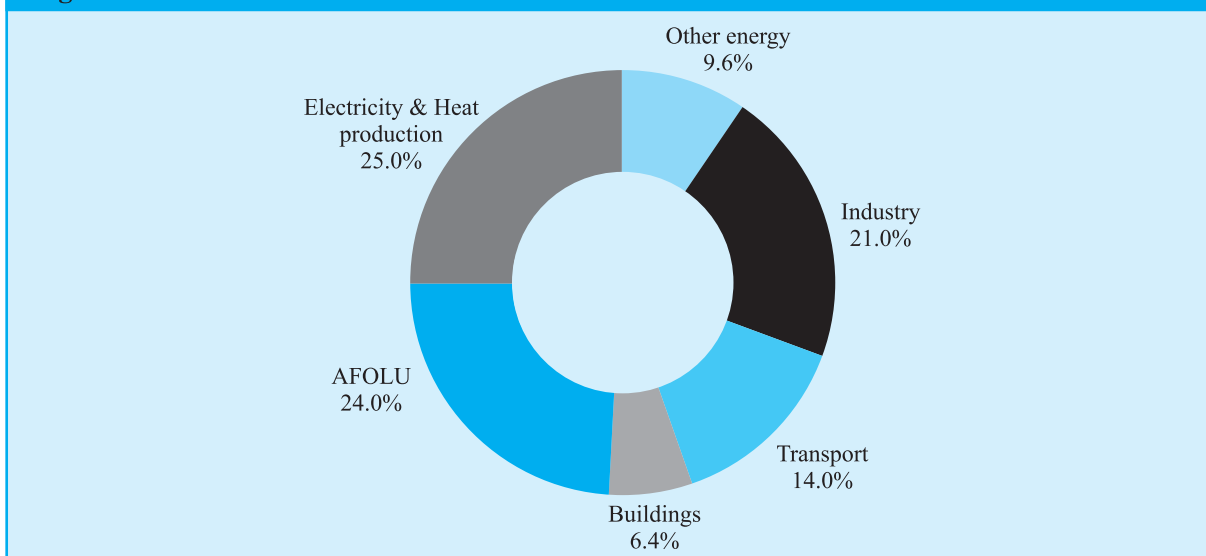
8.11 There are substantial variations in total and per capita emissions of different countries. As per AR5 of IPCC, per capita GHG emissions in 2010 were highly unequal with median per capita emissions for the group of low-income countries (1.4 t CO₂eq/cap) being 9 times lower than median per capita emissions of high income countries (13 t CO₂eq/cap). In terms of absolute CO₂ emissions from fossil fuel use and cement production in 2013, China, the USA, and EU hold the first three positions respectively with India a distant 4th (Figure 8.3). However, in terms of per capita CO₂ emissions from the same sectors in 2013, countries like India, Brazil, and South Africa fall in the bottom 100 among 196 countries (Figure 8.4).

India's Progress on Climate Change

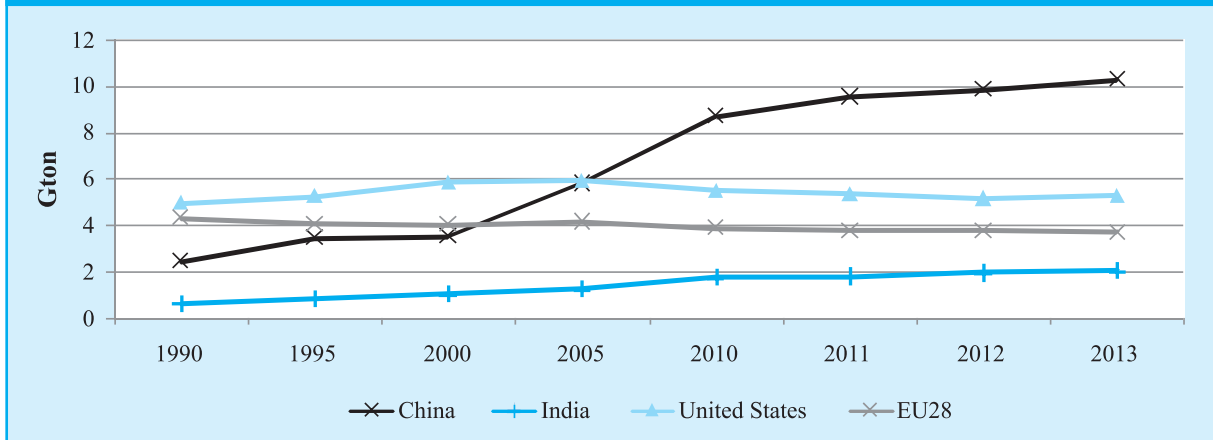
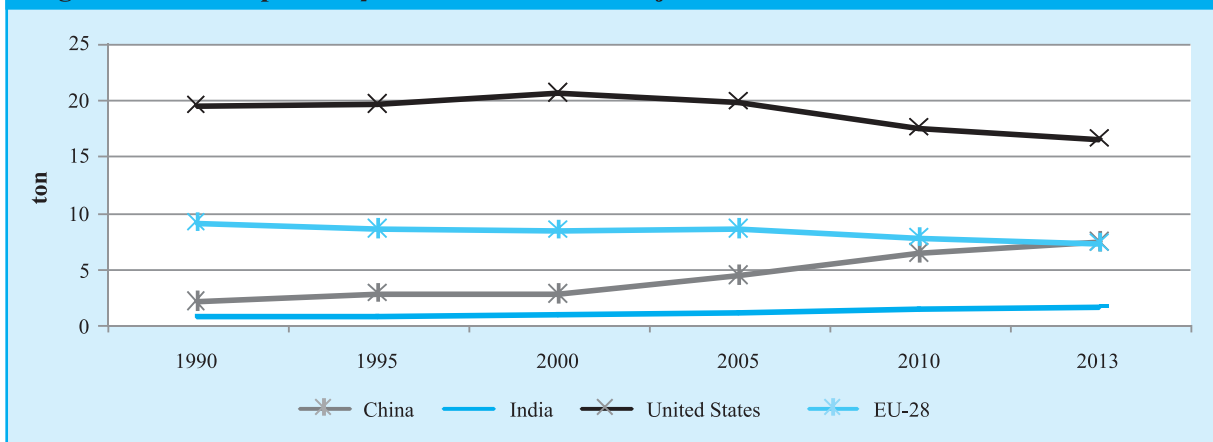
National Action Plan on Climate Change

8.12 India was one of the early adopters of a national climate change plan. Launched way back in 2008, the National Action Plan on Climate Change (NAPCC) outlines policies directed at mitigation and adaptation to combat climate change. India is also working on the voluntary goal

Figure 8.2: Global GHG Emissions from Different Sectors in 2010



Source : IPCC, AR5.

Figure 8.3: Absolute CO₂ Emissions of Some Major Countries**Figure 8.4: Per capita CO₂ Emissions of Some Major Countries**

Source : Trends in Global CO₂ Emissions 2014 Report, European Commission Joint Research Centre
 Note : CO₂ emissions from fossil fuel use and cement production.

of reducing the emissions intensity of its GDP (excluding emissions from agriculture) by 20-25 per cent by 2020 as compared to the base year of 2005. The recent United Nations Environment Programme (UNEP) Emission Gap Report (2014) has recognized India as being one of the countries on track to achieve its voluntary pledges. India is also taking proactive steps in enhancing energy efficiency and expanding renewables to combat climate change. At the same time adaptation measures in agriculture, water resources, and urban areas remain its key priorities.

8.13 India is now revisiting National Missions under the NAPCC in the light of new scientific information (IPCC AR5) and technological advances; undertaking additional interventions in areas like GHG mitigation in power generation,

other renewable energy technology programmes, disaster management, protection of coastal areas, and the health sector; creating capacity at different levels of the government; exploring possibilities of new missions on wind energy, health, waste to energy, and coastal areas; and redesigning the National Water Mission and National Mission on Sustainable Agriculture.

State Action Plans on Climate Change

8.14 Subsequent to the NAPCC, in 2009 all the state governments were requested to prepare State Action Plans on Climate Change (SAPCC). So far, 31 states have prepared and submitted SAPCC documents. The SAPCCs have both adaptation and mitigation components to address climate change impacts, though adaptation has been identified as the more important element. A

combined budgetary requirement of around ₹ 11,33,692 crore has been estimated for implementation of the 31 SAPCCs.

Progress in Expanding the Share of Renewable Energy in India

8.15 India's total renewable power installed capacity as on 31 December 2014 has reached 33.8 GW. Wind energy continues to dominate this share accounting for 66 per cent of installed capacity, followed by biomass, small hydro power, and solar power. As per Census of India 2011, around 1.1 million households are using solar energy to meet their lighting needs and an almost similar number meets cooking energy needs from biogas plants. India's renewable energy sector is driven primarily by the private sector. The government has been promoting private investment in renewable energy through an attractive mix of fiscal and financial incentives, in addition to preferential tariffs being provided at state level. These include capital/interest subsidy, accelerated depreciation, and nil/concessional excise and customs duties. The level of capital subsidy being provided depends on the renewable resources and region, and varies from about 10 per cent to 90 per cent of project costs. The Jawaharlal Nehru National Solar Mission launched in January 2010 seeks to establish India as a global leader in solar energy by creating policy conditions for its diffusion across the country. Installed capacity of Indian solar power in 2013-14 was 2647 MW. As per Bloomberg New Energy Finance/UNEP report, in 2013, there was a total investment of US\$ 6 billion in renewable energy in India. Proposals for the next five years are likely to generate business opportunities of the order of US\$ 160 billion. It offers very good opportunity for businesses to set and scale up industry, leapfrog technologies, and create volumes. Some of India's major immediate plans on renewable energy include scaling up cumulative installed capacity to 170 GW that includes 100 GW of solar power by 2022 and establishing a National University for Renewable Energy.

Clean Energy Cess on Coal

8.16 One of the important instruments being proposed for dealing with climate change is the introduction of carbon taxes. However, very few countries in the world have introduced carbon taxes so far. India introduced a clean energy cess on coal in 2010. This cess on coal which feeds the National Clean Energy Fund (NCEF) has been increased from ₹ 50 to ₹ 100 per tonne in Budget 2014-15. Total collection so far (till 2014-15) under the Fund is ₹ 17,084.45 crore (Budget Estimates—BE) and 46 clean energy projects worth ₹ 16,511.43 crore have been recommended for funding out of the NCEF till September 2014 (Table 8.1). The scope of the NCEF has now been expanded to include funding in the area of clean environment initiatives.

Table 8.1 : Projects Recommended for NCEF Funding

Year	Number of Projects	Amount (₹ in crore)
2011-12	9	566.50
2012-13	6	2715.11
2013-14	12	1229.65
2014-15	19	12000.17
Total	46	16511.43

Progress in Adaptation Actions

8.17 India has also made progress in adaptation actions. The National Bank for Agriculture and Rural Development (NABARD) is India's National Implementing Entity (NIE) for the Adaptation Fund created under the UNFCCC. At present, NABARD is the only NIE in the Asia Pacific Region. In its capacity as NIE, NABARD has generated several feasible proposals on climate change adaptation, five of which, amounting to US\$ 7.3 million, have been submitted to the Adaptation Fund. The Adaptation Fund Board has recently sanctioned the first set of two projects submitted by NABARD with an outlay of US\$ 3.2 million for promoting climate resilient agriculture systems in West Bengal and enabling the fisheries sector in Andhra Pradesh.

8.18 Additionally, NABARD is implementing several development projects to promote sustainable development livelihood through Natural Resource Management, such as watershed development and sustainable livelihood for tribal communities. NABARD has sanctioned a pilot project of ₹ 21 crore on climate change adaptation in Maharashtra to develop knowledge, strategies, and approaches that will enable vulnerable communities to adapt to the impending impacts of climate change. Under NABARD Infrastructure Development Assistance, it is financing green investments in solar power generation and improvement of electricity distribution networks which includes India's first 1MW canal-top solar power project in Gujarat.

8.19 Further, as a follow-up of its announcement in Budget 2014-15, a 'National Adaptation Fund' with an initial corpus of ₹ 100 crore has been set up to support adaptation actions to combat the challenges of climate change in sectors like agriculture, water, and forestry.

Domestic Carbon Market Mechanisms

8.20 Simultaneously, there have been a number of actions on the domestic front to create carbon markets. An important one is the Perform, Achieve & Trade (PAT) scheme which is being implemented for the designated industries under the National Mission on Enhanced Energy Efficiency. The activities under the PAT scheme provide opportunities for new markets as it devises cost-effective energy efficient strategies for end-use demand-side management leading to ecological sustainability. The PAT scheme covers 478 plants (designated consumers) in eight energy-intensive industrial sectors accounting for one-third of total energy consumption. The target for reduction in average specific energy consumption under PAT is 4.05 per cent during PAT Cycle 1 (1 April 2012 to 31 March 2015). As a major initiative of the National Solar Mission under the NAPCC, renewable energy certificates (REC) seek to address the mismatch between availability of renewable energy sources and the requirement of the obligated entities to meet their renewable purchase obligations. The value of an REC is equivalent to 1 MW hour of electricity injected

into the grid from renewable energy sources. As per the Renewable Energy Certificate Registry of India, a total of 16,58,593 solar RECs were issued till January 2015.

International State of Negotiations: Twentieth Session of the Conference of Parties to the UNFCCC

8.21 The just concluded twentieth session of the Conference of Parties to the UNFCCC (COP 20) in December 2014 in Lima, Peru, was an important milestone as it came out with a 'Lima Call for Climate Action' after long deliberations and intense negotiations (Box 8.1). With less than a year left to conclude the deal in Paris later this year, nations are working hard towards finalizing the agreement by December 2015 at the COP 21 session in Paris.

8.22 India's main concern in the negotiations was to protect its long term interests and emphasize the need for growth and development space to tackle the problem of eradicating poverty, providing energy access to all and address other developmental priorities. India's stand in the negotiations was guided by the principle of Equity and Common but Differentiated Responsibilities (CBDR) (Box 8.2).

International Climate Finance Flows

8.23 The UNFCCC squarely places the responsibility of providing climate finance to the developing countries on the developed countries. For this purpose a financial mechanism for the provision of financial resources on a grant or concessional basis, including for the transfer of technology, has been defined in Article 11 of the Convention.

8.24 The Global Environment Facility (GEF) is one of the two operating entities under the financial mechanism as per Article 11. It funds projects in energy efficiency, renewable energy, sustainable urban transport, and sustainable management of land use, land-use change and forestry and climate-smart agriculture. Recently, thirty donor countries pledged US\$ 4.43 billion for the GEF-6 cycle (July 2014 – June 2018). India has received an allocation of US\$ 130.58 million under this, of

Box 8.1 : Key Lima Outcomes

The UNFCCC negotiations focused on the finalization of elements of the draft negotiating text for the 2015 Paris agreement, identification of information to be submitted by Parties under the Intended Nationally Determined Contributions (INDCs), and enhancement of pre 2020 actions. Some of the important outcomes of the Lima Conference are the following:

- The Lima Conference has decided that the new agreement will be under the UNFCCC and will reflect the principle of CBDR in the light of different national circumstances. It also addresses all elements, i.e. mitigation, adaptation, finance, technology development and transfer, capacity building, and transparency of action and support in a balanced manner.
- The draft text has to be finalized by May 2015 in order to be placed for consideration and adoption of Parties at COP 21.
- Another key decision was that countries should not backslide from current pledges under the INDCs and their contribution has to be more than their current commitments. The final decision successfully ensured that countries can include adaptation, finance, technology development and transfer, capacity building, and transparency of action and support also in their INDCs, in addition to mitigation. There is also no 'ex-ante assessment' to be undergone.
- Now countries have to submit quantifiable information on the reference point (base year), time frames, scope and planning process, assessments, etc. related to the INDCs. This will be published on the UNFCCC website and a Synthesis Report of the aggregate effect of the INDCs prepared by 1 November 2015.
- It was decided to accelerate action on enhancing the pre-2020 actions like early ratification of the Kyoto Protocol second commitment period, revisiting of targets and conditionalities associated with it, and provision of finance, technology, and capacity building support by developed countries to developing countries.
- On the issue of finance, developed countries have been invited to provide clarity on reaching the US\$ 100 billion goal by 2020, by way of enhanced information and greater transparency and predictability for scaling up climate finance. On the Green Climate Fund (GCF), pledges amounting to US\$ 10.2 billion for initial capitalization of the Fund have been acknowledged. It was further decided to urge contributors to confirm these pledges in the form of fully executed contribution agreements so that at least 50 per cent of pledges made till November 2014 are reflected as fully executed contribution agreements by 30 April 2015.

which US\$ 87.88 million is for climate change mitigation focal area. Till date, India has accessed US\$ 477.3 million of GEF grant of which US\$ 284.2 million is for climate change mitigation projects and US\$ 10 million is for climate change adaptation projects. The GEF also manages two separate adaptation-focused funds under the UNFCCC— the Least Developed Countries Fund and the Special Climate Change Fund— which mobilize funding specifically earmarked for activities related to adaptation.

8.25 The GCF is also an operating entity of the financial mechanism of the Convention set up in 2011. The GCF is expected to become the major channel of mobilizing a significant share of the US\$ 100 billion climate finance from developed

to developing countries in the coming years, helping the latter in their efforts to combat climate change and adjust their development pathways to a more climate-friendly one. Significant progress has been made towards operationalizing the GCF. Some of the breakthrough decisions adopted include: 50:50 allocation for mitigation and adaptation over time; maximizing engagement with the private sector through a special Private Sector Facility of the Fund; and the intention of defining the Fund's gender action plan soon. As of date, US\$ 10.2 billion in grants has been pledged to the GCF. The GCF is currently structured into two themes— mitigation and adaptation and one modality which is the Private Sector Facility. With this, the GCF is now ready for business.

Box 8.2 : Climate Change Issues: India's Stand

India has been following action-oriented policies to bring rapid development to its people while purposefully addressing climate change. India has been one of the foremost advocates of long-term global cooperation in combating climate change in accordance with the principles and provisions of the UNFCCC. Climate change impacts being witnessed today are a result of the total accumulated greenhouse emissions for which the major responsibility lies with the developed nations. Moreover, despite the fast growth registered by some of the developing countries, a large proportion of people in these countries still live in extreme poverty. The Indian stance in the climate change negotiations has been guided by the principle of CBDR. India thus believes that the climate change agreement of 2015 should take into consideration a whole gamut of issues including adaptation, finance, technology development and transfer, capacity building, transparency of action and support in a balanced manner, and loss and damage in addition to mitigation.

Mitigation: Historical responsibilities of developed countries and equity in access to global atmospheric resources should continue to be the basis of defining mitigation commitments. The 2015 agreement must ensure that the developing countries be given their fair share of carbon and development space. The contribution of developing countries to mitigation efforts is far greater than that of developed countries and could be further enhanced if developed countries effectively implement and significantly increase their commitments of providing finance, technology, and capacity building support to developing countries.

Adaptation: Equal weightage has to be given to adaptation as it is essential for reducing vulnerabilities of communities to climate change. This assumes more importance in view of the fact that the developing countries are the most vulnerable to climate change. However, both global action and finance flows have been biased in favour of mitigation. The developing countries are pushing hard to include adaptation in a comprehensive and balanced manner in the 2015 agreement.

Finance: The responsibility of providing financial assistance to the developing countries lies with the developed countries and this has been clearly articulated in the UNFCCC. India together with other developing countries continue to urge the developed countries to honour their obligation to provide new, additional, and predictable financial support to developing countries in a measurable, reportable, and verifiable manner. In this context ambitious capitalization of the GCF assumes significance. Developed countries have been urged to provide clear timelines and pathways to reach the US\$ 100 billion annual commitment made by them in 2010.

Technology transfer: Technology forms a major component of any move towards combating climate change. The important issue in this regard is that while the developed countries are the frontrunners in clean technology, the developing countries do not possess either sufficient technical capability or the financial resources to develop clean technologies. Appropriate mechanisms for smooth transfer of technology from the developed to developing countries have to be agreed upon. The intellectual property rights price-tag should not come in the way of such technology transfer.

8.26 The GCF follows a 'country-driven approach', which envisages effective involvement of various stakeholders at all levels and also enables the developing countries to evolve their climate policy keeping in consideration their immediate development priorities like poverty reduction and improving standards of living for a large proportion of their population. The effectiveness with which a country is able to tap the resources from the GCF and use them effectively is dependent on how well the country's government and its various institutions have prepared themselves to access the Fund. The first step is building the institutional capacity of the country. India has moved forward in this regard

by selecting the Ministry of Environment, Forests and Climate Change as India's Nationally Designated Authority (NDA) for the GCF, which will recommend to the Board of the GCF funding proposals in the context of national climate strategies. The next step is to select competent NIEs which will be accredited by the GCF Board and will oversee the implementation of the project by the Executing Entities. Given the country-driven approach of the GCF, the onus also lies on the recipient countries to decide how to use the resources accessed from the GCF. This calls for prioritizing the sectors and projects that will yield maximum sustainable development benefits for India. Currently efforts are under way by the

government to build India's institutional capacity including the selection of NIEs and an overall framework for effectively accessing resources from the GCF.

International Carbon Markets

8.27 India's participation in the carbon market is a story of success. India has been proactive in its approach to the carbon market and represents a significant component of the global market of the Clean Development Mechanism (CDM) established under the Kyoto Protocol. As on 1 December 2014, 1541 of the total 7589 projects registered by the CDM Executive Board are from India. This so far is the second highest in the world with China leading with 3763 registered projects. The total certified emission reductions (CER) issued so far are 1.52 billion units, and CERs issued to Indian projects are 191 million units (13.27 per cent). Also, as on 31 December 2014, the National CDM Authority in India has accorded approval to 2941 projects facilitating an investment of more than ₹ 5,79,306 crore in the country. These projects are in the sectors of energy efficiency, fuel switching, industrial processes, municipal solid waste, renewable energy, and forestry.

8.28 In the second commitment period of the Kyoto Protocol (2013-2020), the number of CDM projects has come down drastically. In 2012, there were 3227 projects registered with the UNFCCC and in 2013 only 307 projects were registered under the CDM. Interestingly, in 2013 India has registered 115 projects, which is the highest number by any country. In 2014, India registered 56 projects with the UNFCCC.

8.29 Although international dialogue continues to intensify focus on a robust and meaningful international climate change agreement in 2015, the lack of mitigation ambition in the pre-2020 period continued to slow down the momentum in the international market-based mechanisms. In fact, Parties participating in the second commitment period of the Kyoto Protocol represent only 12 per cent of global emissions. Some major players pulled out of the Kyoto Protocol, which has further

suppressed the limited demand of Kyoto credits. As per a World Bank Group report, the current demand is estimated to be around 1120-1230 megatons of CO₂ equivalent (MtCO₂e), as against a supply of 3500-5400 MtCO₂e for 2014-2020, around three to five times the expected demand.

8.30 Proposals to augment the demand for carbon credits and a price stabilization mechanism are being negotiated. This includes proposals to create new market mechanisms within and beyond the Kyoto Protocol within an appropriate framework. While the CDM will continue to function during the period from 2013 to 2020, the manner in which it will get subsumed within these new mechanisms for an effective carbon market is to be seen (Box 8.3).

SUSTAINABLE DEVELOPMENT

8.31 Planetary boundaries in terms of sustainable development can be understood in terms of ecological footprint which is suggestive of the pressure human activities put on ecosystems, which when compared to bio capacity (a measure of the capacity of ecosystems to produce useful biological materials and to absorb waste materials generated by humans) tells us if we are running in surplus or deficit. Data shows that the world is living in a situation of ecological overshoot. In 2010, the global ecological footprint was 18.1 billion global hectares (gha), or 2.6 gha per capita, and the earth's total bio capacity was 12 billion gha, or 1.7 gha per capita, as per the Living Planet Report 2014. Bio capacity is not spread evenly around the world. Unfortunately the low-income countries have the smallest footprint but suffer the greatest ecosystem losses. Moderate UN scenarios suggest that if current population and consumption trends continue, by the 2030s we will need the equivalent of two earths to support us.

8.32 As per a McKinsey report, India is at the threshold of an urban flare-up. The population of Indian cities will increase from 340 million in 2008 to 590 million by 2030. In the 2030s India's largest cities will be bigger than many major countries. As population increases, demand for every key service will increase five to sevenfold. These trends,

Box 8.3 : CDM and the Future of Carbon Markets

The CDM, a type of carbon market created multilaterally under the UNFCCC, has proved to be one of the most effective mitigation instruments. Though lack of mitigation ambition in the pre-2020 period has slowed down its momentum, efforts to harness the full potential of the CDM, the world's largest global carbon market, are picking up. Many developing countries including India have greatly benefited from and contributed to the emission reduction initiative through the CDM. While countries look for a new market mechanism, there are strong reasons to build on the powerful CDM tool for the reasons given in Table 1. The CDM Board has also agreed to a budget that will allow CDM operations to continue upto 2020.

Table 1 : CDM-related facts

Emissions reduced or avoided	-	1.5 Gt of CO ₂ eq
7700 + projects and programme of activities registered in less than 10 years	-	Average of over 2 projects per day
1 US\$ of public money invested in the CDM on average leverages	-	10 US\$ in private-sector investment
US\$ 130 billion investment in GHG-reducing activities	>	Total annual ODA flow in 2011
Money saved by EU Emissions Trading Scheme installations from 2008 to 2012 through CER purchased	=	US\$ 6 - 28 billion
155 countries involved in the CDM	=	Over three-fourths of the countries in the world

Source: UNFCCC; *State and Trends on Carbon Pricing, World Bank 2014.*

Apart from the CDM, the reach of carbon pricing across the globe is steadily increasing. As per a World Bank Group report, a total of eight new carbon markets opened their doors in 2013 alone. With these new instruments, the world's emissions trading schemes are worth about US\$30 billion. With a global climate deal set to be finalized in 2015 and substantial incremental finance required to tackle the climate problem, carbon markets and pricing are expected to play a key role in controlling emissions. New approaches to market-based mechanisms are being developed to help fast-track their deployment and maximize investment in low carbon technologies. These are being termed as reformed CDM, or New Market Mechanisms.

These developments are likely to help India, as till now limited options were available to Indian CDM project developers who had to sell at prevailing prices. With Indian-registered projects expected to generate substantial CERs by 2020, Indian CER holders are now looking forward to selling their CERs once the carbon markets pick up.

combined with the current challenges of poverty eradication, food and energy security, urban waste management, and water scarcity, will put further pressure on our limited resources which will add to greater energy needs and lead to increase in emissions if further decoupling doesn't take place. At the same time, hidden in this challenge are great opportunities. Unlike many countries, India has a young population and therefore can reap the fruits of its demographic dividend. With more than half of the India of 2030 yet to be built, we have an opportunity to avoid excessive dependence on fossil fuel-based energy systems and carbon lock-ins that many industrialized countries face today. A conscious policy framework which takes into account both development needs and environmental considerations could help in turning the challenges into opportunities.

8.33 There has been a growing political drive towards the post 2015 development agenda due for agreement in September 2015. In this direction, the thirty-member Open Working Group mandated by the Outcome Document—"The Future We Want"—of the UN Conference on Sustainable Development (Rio+20) held in June 2012 at Rio came out with a set of 17 SDGs in July 2014 (Box 8.4). The SDGs cover a broad range of sustainable development issues and also focus on means of implementation as one of the overarching goals to achieve the SDGs. These are expected to be integrated into the UN's post-2015 Development Agenda. At present, the post-2015 agenda and SDG processes are moving rapidly towards their conclusion this year.

Box 8.4 : SDGs

1. End poverty in all its forms everywhere
2. End hunger, achieve food security and improved nutrition, and promote sustainable agriculture
3. Ensure healthy lives and promote well-being for all at all ages
4. Ensure inclusive and equitable quality education and promote life-long learning opportunities for all
5. Achieve gender equality and empower all women and girls
6. Ensure availability and sustainable management of water and sanitation for all
7. Ensure access to affordable, reliable, sustainable, and modern energy for all
8. Promote sustained, inclusive and sustainable economic growth, full and productive employment, and decent work for all
9. Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation
10. Reduce inequality within and among countries
11. Make cities and human settlements inclusive, safe, resilient, and sustainable
12. Ensure sustainable consumption and production patterns
13. Take urgent action to combat climate change and its impacts
14. Conserve and sustainably use the oceans, seas, and marine resources for sustainable development
15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all, and build effective, accountable and inclusive institutions at all levels
17. Strengthen the means of implementation and revitalize the global partnership for sustainable development.

8.34 On the domestic front, India has been working towards environmental safety without compromising on the goal of rapid economic growth. Accordingly, India's development plans lay a balanced emphasis on economic development

and the environment. The country has witnessed the introduction of landmark environmental measures for conservation of rivers, improvement of urban air quality, enhanced forestation, significant increase in installed capacity of renewable energy technologies, shift towards public transport, and enhancing rural and urban infrastructure. Recent key initiatives include: the Swachh Bharat Mission, Clean Ganga Plan, scaling up of the National Solar Mission fivefold from 20,000 MW to 1,00,000 MW with an additional investment requirement of US\$ 100 billion, development of 100 smart cities with integrated policies for sustainable development, and preparations for developing a National Air Quality Index and a National Air Quality Scheme.

8.35 To sum up, political awareness on the issue of climate change and sustainable development both in the international arena and on the domestic front has risen considerably. Many developing countries including India have made considerable progress in tackling climate change issues. The year 2015 is likely to witness a series of events in the run up to the Paris agreement. As we put our acts together towards a post-2015 agreement on climate change, it is absolutely critical to ensure that the new agreement is comprehensive, balanced, equitable, and pragmatic. It should address the genuine requirements of developing countries like India by providing them equitable carbon and development space to achieve sustainable development and eradicate poverty. To achieve this, adherence to the principles and provisions of the UNFCCC is critical. Importantly, global climate action rests heavily on the means of implementation, especially finance and technology, and the agreement should adequately address this. As India's Prime Minister Shri Narendra Modi said in the UN General Assembly in September 2014, "We should be honest in shouldering our responsibilities in meeting the challenges. The world community has agreed on a beautiful balance of collective action—common but differentiated responsibilities. That should form the basis of continued action."