

INDIA'S APPROACH AND POSITION ON CLIMATE CHANGE GOVERNANCE

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India recognises that climate change is a significant global problem and an issue of great socio-economic and political importance. Currently, the global average temperature has already risen over 1 degree Celsius (°C) since the pre-industrial period, increasing at a rate of about 0.2 degrees Celsius per decade.¹ At the current rate, the global average temperature rise is likely to exceed more than 1.5 °C by 2030, ten years earlier than it was projected by the IPCC AR5 in 2014.² The latest IPCC report warned that a threshold of 1.5 °C will lead to serious and irreversible consequences for several centuries.³ Warming of 1°C is already causing widespread disruptions globally, in various sectors, including agriculture, human health, infrastructure, water management, biodiversity management, etc.

It is now well-established that the magnitude and rate of contemporary warming of the atmosphere, land and oceans are predominantly due to human activities such as the burning of fossil fuels, deforestation and changes in land use and land cover (LULC) during the industrial period which has substantially changed the atmospheric composition of greenhouse gases.⁴ The increasing rise in global temperature has already contributed to a significant increase in weather extremes globally, such as heatwaves, heavy rainfall events, tropical cyclones, and changes in wind and ocean currents. Global warming has also led to large scale changes such as degradation of marine and terrestrial ecosystems, acidification of the global ocean, melting of sea ice, glaciers and polar ice caps, and rise in sea levels, most of these changes are now unavoidable and irreversible over hundreds or even thousands of years.⁵ Recent events and expert analyses suggest the impacts of climate change have the potential to cause significant political and social disruptions at the national, regional and global levels, driven by increasing competition for scarce resources, market fluctuations, forced human migration, infectious diseases, etc.

¹IPCC, M.R. Allen, Dube, W.Solecki et al. Framing and Context, In: Masson-Delmotte, V.P Zhai, et al. (eds), An IPCC Special Report on the Impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emissions pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty, Special Report, Global Warming of 1.5 Degree Celsius, Cambridge University Press: UK and New York, (2018): 49-92.

<https://www.ipcc.ch/sr15/chapter/chapter-1/>

² IPCC, 2014, Climate Change 2014: Synthesis Report, Contribution of Working Groups 1, II and III to the fifth Assessment Report of the Intergovernmental Panel on Climate Change, Core Team, R.K. Pachauri and L.A. Meyers (eds.), IPCC, Geneva, Switzerland, 151, <https://www.ipcc.ch/report/ar5/syr/>

³ Rajib Shaw, Yong Luo, Tae Sung Cheong, et al. Chapter 10, Asia, In: Climate Change 2022, Impacts, Adaptation and Vulnerability, IPCC WGII Sixth Assessment Report, 2022.

https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_FinalDraft_Chapter10.pdf

⁴ Rajib Shaw, Yong Luo, Tae Sung Cheong, et al. Chapter 10, Asia, In: Climate Change 2022, Impacts, Adaptation and Vulnerability, IPCC WGII Sixth Assessment Report, 2022.

⁵ IPCC, The Sixth Assessment Report, Climate Change 2021: the Physical Science Basis, 2022, <https://www.ipcc.ch/assessment-report/ar6/>

India's participation in the global climate discourse has been shaped primarily by a scientific understanding of its domestic vulnerabilities to climate change and the adverse impacts on the country's environment, economy, and society. Its approach is grounded in the principles of common but differentiated responsibilities, climate justice and equity but outlined by a more flexible outlook towards emissions reductions. Over the last three decades of climate change negotiations, India has emerged as a global leader in climate action, balancing its national-level development goals with urgent actions to fulfil its climate change commitments.

1. IMPACTS OF CLIMATE CHANGE ON INDIA

India has a distinct geographical entity (Indo-Gangetic Plains, Central Highlands and Deccan Plateau, Thar Desert, Himalaya and Northeast Mountain Ranges, East Coast, West Coast, and Bordering seas and islands) with significant variations in climate and regional and local weather conditions across the country. India is the second largest populous country in the world and has a unique geo-climatic profile. It is one of the most disaster-prone countries in the world,⁶ “*where 59% of the land is vulnerable to earthquakes, 8.5% of the land is vulnerable to cyclonic storms and 5% of the land is susceptible to river basin floods.*”⁷ Moreover, the majority of the population is dependent on climate-sensitive sectors like agriculture, forestry and coastal ecosystems for livelihoods.⁸ Climate-change-induced changes in extreme temperatures, heavy precipitation, cyclonic storms, and sea level rise, exacerbate India's vulnerability to a whole range of hydrometeorological hazards which are rising alarmingly, both in terms of their intensity and frequency, and decreasing in their predictability.

According to a 2020 report by the Ministry of Earth Sciences (MoES) of the Government of India entitled “*Assessment of Climate Change over the Indian Region*”, summer heat waves are projected to increase by three to four times in frequency and are expected to become longer in duration, by the end of the century compared to the 1976-2005 baseline period.⁹ The report also noted that India's summer monsoon precipitation from June to September has reduced by 6 per cent as compared to the period 1951 to 2015 and with a marked decline in rainfall over the Indo-Gangetic Plains and the Western Ghats. At the same time, more intense extreme wet spells during the summer monsoon season have been observed over central India. Specifically, the intensity of rainfall beyond 150 mm per day increased by about 75 per cent

⁶ Ministry of Environment, Forest and Climate Change, Government of India, India, First Biennial Update Report to the United Nations Framework Convention on Climate Change, India's Third National Communication to the UNFCCC, 2015, <https://unfccc.int/resource/docs/natc/indbur1.pdf>

Also see: David Eckstein, Vera Künzel, Laura Schäfer, Maik Wings, “Who Suffers Most from Extreme Weather Events? Weather-Related Loss Events in 2018 and 1999 to 2018”, Global Climate Risk Index 2020, Briefing Paper, Germanwatch, 2019, https://germanwatch.org/sites/germanwatch.org/files/20-201e%20Global%20Climate%20Risk%20Index%202020_10.pdf

⁷ Ministry of Environment, Forest and Climate Change, Government of India, India, First Biennial Update Report to the United Nations Framework Convention on Climate Change, India's Third National Communication to the UNFCCC, 2015, <https://unfccc.int/resource/docs/natc/indbur1.pdf>

⁸ Ibid

⁹ R.Krishnan, J. Sanjay, Chellappan Gnanaseelan, et al. (eds), “*Assessment of Climate Change over the Indian Region: A Report of the Ministry of Earth Sciences (MoES), Government of India*”, (Springer Open, 2020), https://doi.org/10.1007/978-981-15-4327-2_1.

during 1950-2015 and the frequency of daily precipitation extremes also increased during this period.¹⁰ Overall, studies have shown that the monsoon pattern has become more erratic and extreme in recent years and the trend is expected to continue in the future. Changes in the monsoonal rainfall pattern are causing widespread devastation in India. In April 2022, Assam faced its worst flooding in decades which affected about 2,930 villages and 1.9 million people since the monsoon season began on 06 April 2022.¹¹ It destroyed homes, infrastructures and delayed the sowing of crops such as rice and reduced agricultural productivity. In 2021, the state of Bihar experienced record-breaking rains which led to mass displacement of more than 800,000 people, including 375,000 children, after their homes were flooded.¹² In 2019, 11.8 million people across India got impacted by the intense monsoonal flooding with the economic damage estimated to be around USD 10 billion.¹³

India is also witnessing huge variations in the geographical distribution of monsoon rains. For instance, in 2022, during the first two months of the southwest monsoon states of Telangana, Tamil Nadu, Gujarat, Dadra and Nagar Haveli, Daman and Diu received excess rainfall, while other states including Uttar Pradesh (58% deficit) Jharkhand (51% deficit), Bihar (45% deficit), West Bengal (29% deficit) and Kerala (19% deficit) received less rain than normal rainfall.¹⁴ Due to these variations of monsoon precipitation over India, the frequency and spatial extent of droughts have also increased significantly from 1951 to 2016. It is projected that many regions in the semi-arid and drought-prone central part of India are likely to experience a simultaneous decline in rainfall of the order of 5-25 per cent. A probable increase in drought intensity over the Indian region will severely affect food security, water security, agriculture production and livelihoods.¹⁵

Climate change is affecting the Indian Himalayan region as well. Often described as the *canaries in the coal mine*, the mountain glaciers are melting at alarming rates due to rising temperature and changes in the precipitation pattern over the Hindu Kush Himalayan (HKH) region, threatening water and food security of local communities and the natural biodiversity in the region. Future warming in the HKH region is predicted to be between 2.6 and 4.6 °C by the end of the twenty-first century. At those levels of warming, we can expect complete collapse of the Himalayan glaciers and associated ecosystems.

¹⁰ Ibid

¹¹ OCHA, "Situation Report-Assam Floods", 22 June 2022, <https://reliefweb.int/report/india/situation-report-assam-floods-22-jun-2022>

¹² Save the Children, "375,000 Children Displaced and three Dead in Flood-hit India", 21 July 2021, India, <https://www.savethechildren.net/news/375000-children-displaced-and-three-dead-flood-hit-india>

¹³ David Eckstein, Vera Künzel, Laura Schäfer, Maik Winges, "Who Suffers Most from Extreme Weather Events? Weather-Related Loss Events in 2019 and 2000 to 2019", Global Climate Risk Index 2021, Briefing Paper, Germanwatch, 2021, https://germanwatch.org/sites/default/files/Global%20Climate%20Risk%20Index%202021_1.pdf

¹⁴ Akshit Sangomla, "Monsoon 2022: Could Long-term Trend be Causing Huge Variation in Rainfall", DowntoEarth, 22 July, 2022, <https://www.downtoearth.org.in/news/climate-change/monsoon-2022-could-long-term-trend-be-causing-huge-variation-in-rainfall-83891>

¹⁵ Chime Youdon, "Impact of Climate Change on Coastal Cities: An Integrated Adaptation Approach", National Maritime Foundation, 29 November, 2020, <https://maritimeindia.org/wp-content/uploads/2020/11/Chime-Youdon-Vulnerability-of-Coastal-Cities.pdf>

Within India's maritime domain, the situation is equally serious. In just the period from 1951 to 2015, the Sea Surface Temperature (SST) of the tropical Indian Ocean has risen by 1°C on average, which is markedly higher than the global average SST warming of 0.7°C, over the same period.¹⁶ The warming of the ocean significantly impacts the entire marine food chain causing migration of hundreds of species — from microscopic phytoplankton to higher tropic species of fish — upon which India's own food security and economic security, as also the food and economic security of nations in India's neighbourhood, are increasingly dependent.

Moreover, extreme weather events and sea-level rise are likely to continue to be major risk factors for coastal cities in India, where one-third of the population [which is nearly 170 million people] is located. The Indian coastline hosts several human agglomerations, ranging from fishing hamlets and villages to megacities. The rate of sea-level rise will continue to accelerate further with the rising global average temperature. Climate models based future projections suggest that many low-lying areas along India's densely populated coastline will be inundated by the middle of the 21st century. Even small fractions of sea level rise will aggravate the impacts of extreme weather events such as coastal flooding and cyclonic storms. In addition to their impacts on coastal human settlements, sea level rise and extreme weather events will also have adverse impacts on coastal ecosystems such as mangrove forests, seagrass, and coral reefs, that provide critical socio-economic services to coastal communities. Additionally, salt-water intrusion into agricultural lands and underground aquifers due to sea level also pose threats coastal food and water security.¹⁷

India has been witnessing a sharp surge in extreme cyclonic activity in recent years. High-intensity cyclones such as *Vayu* (2019), *Nisarga* (2020) and *Tauktae* (2021) struck India's western coast, while *Phailin* (2013), *Hudhud* (2014), *Ockhi* (2017), *Titli* (2018), *Matmo* (2019), *Fani* (2019), *Amphan* (2020) and *Yaas* (2021) struck India's eastern coast have wreaked year-on-year havoc in India's coastal areas. These climate-change-induced hazards such as extreme heat, flooding, cyclonic storms and sea level rise are major threats to India's critical maritime infrastructure as well, such as energy infrastructure, transport infrastructure, national security infrastructure, etc. For instance, India has 12 major seaports (managed by the central governments) and over 200 non-major seaports (managed by state governments or private companies, that are critical nodes of India's maritime trade which accounts for nearly 95 per cent, by volume, and 70 per cent, by value, of India's overall trade.

Recognising the numerous challenges posed by climate change, India has long expressed its concern over the national and global impacts of accelerating climate change and actively engaged in multilateral negotiations under the United Nations' Framework Convention on Climate Change (UNFCCC) in a positive, constructive, and forward-looking manner. India's positions at the UNFCCC negotiations have been supported by commensurate action at the national level in terms of ambitious climate change policies, a consistent push renewable energy

¹⁶ R Krishnan, J Sanjay, et al, eds., "Assessment of Climate Change over the Indian Region", A Report of the Ministry of Earth Sciences (MoES), Government of India, 2020, <https://doi.org/10.1007/978-981-15-4327-2>

¹⁷ Chime Youdon, "Impact of Climate Change on Coastal Cities: An Integrated Adaptation Approach", *National Maritime Foundation*, 29 November 2020, <https://maritimeindia.org/impact-of-climate-change-on-coastal-cities-an-integrated-adaptation-approach-part-i/>

capacity augmentation, preservation of natural ecosystems, and promotion of disaster risk reduction and climate change adaptation measures.

2. INDIA'S CONTRIBUTION TO GLOBAL ACTION ON CLIMATE CHANGE

International efforts to adequately address the detrimental impacts of climate change and the struggle of the international community to achieve concerted global momentum to address the issue have been ongoing for three decades under the UNFCCC. Since the beginning, the negotiations on climate change have been largely shaped by the divisions between and different perspectives of the Global North and the Global South. It has generally been recognised, based on observed trends, that the industrialised/ developed economies are primarily responsible for most of the accumulated global greenhouse gas emissions in the atmosphere since the industrial revolution, developed countries have significantly higher per capita emissions compared to developing, and that majority of future global carbon emissions are expected to originate from fast-growing developing economies, such as China and India. It is also widely understood that developed and developing and least developed countries have widely different levels of vulnerability to the impacts of climate change, and they do not have the same level of technological and financial capacity to adapt to those impacts.

Given India's high population density, fast growing economy, and that it is the fourth largest carbon emitter (after China, USA, and the European Union), India's participation in climate change negotiations continues to have far-reaching implications for global cooperation on climate change. Indeed, India has consistently played an active role in the negotiations and established itself as a coalition-builder and protector of the global south's interests.

2.1. Evolution of India's Position in Global Climate Change Negotiations of the UNFCCC

The evolution of India's involvement and its position in global climate change negotiations can be seen in the context of three broad phases of the negotiations. The first phase concentrated on the creation of an international regime and climate agenda and to quantify Annex I parties' (developed countries) emission reduction targets from Rio in 1992 to Kyoto in 1997. India played an important role in representing the interests and perspectives of the developing and least developed countries and strongly advocated the principles of equity and 'common but differentiated responsibilities' rooted in the fact that developing countries have relatively negligible contributions to total cumulative emissions and have much lower per-capita emissions. In the second phase extending from 2000 to 2009, in the run-up to the Copenhagen Climate Summit to set a new climate regime post-2012, India pushed for climate finance, technology sharing, and establishment of an adaptation fund to accelerate climate action in developing countries and protect the least developed countries from the worst effects of climate change. The third phase, between Copenhagen in 2009 and Paris in 2015, marked India's transition towards a more flexible, cooperative and holistic approach. At the national level, India formulated its National Action Plan on Climate Change and submitted its Nationally

Determined Contributions to the UNFCCC taking into account the principle of common but differentiated responsibilities and respective capabilities (CBDR-RC). At COP21 in Paris, India discussed its voluntary commitments and set its emission reduction targets. Post-2015, India has focussed on adopting measures to achieve its NDCs under the Paris Agreement of the UNFCCC. Each of these periods has been marked by India's strong political leadership in the negotiations. India's position and activities during these phases are discussed in more detail below.

2.1.1. Phase I: International Regime Creation and Agenda Setting: Rio to Kyoto Protocol

After the UNFCCC came into force in 1994, it convened the first Conference of the Parties (COP) in 1995 to stabilise GHG emissions to 1990 levels by the year 2000. India, along with other developing countries, voiced concerns about sharing the burden of climate actions by arguing that developed countries (or Annex I countries) were responsible for the vast majority of the greenhouse gases accumulated in the atmosphere and that per capita emissions in developing countries are still relatively negligible. Scientific evidence unequivocally suggested that climate change is occurring due to the accumulated impact of GHGs in the atmosphere which were emitted by the developed countries during the last 200 years of fossil-fuel powered industrialisation. India took a strong position on the grounds of climate justice and fair responsibility. Consequently, 'the Berlin Mandate' was adopted at COP 1 by the parties which agreed that developed countries would submit quantified emission reduction targets to strengthen global climate action and it was explicitly noted that developing countries would not introduce any new commitments.¹⁸

The Kyoto Protocol to the UNFCCC was formally adopted at COP 3 at Kyoto in December 1997, where Annex I countries agreed to take on individual, quantified, legally binding emissions reduction targets. The members agreed to reduce carbon emissions, relative to the 1990 levels, by at least 5 per cent during the first five-year commitment period from 2008 to 2012.¹⁹ India strongly endorsed the Kyoto Protocol as a concrete measure as it laid out binding emission reduction targets for all Annex I countries. The Kyoto Protocol indeed marked a big step forward in terms of legal instruments for future climate change negotiations. Importantly, however, the largest GHG contributor, USA, refused to ratify the binding targets until developing countries including India agreed to set their emission reduction targets as well.

India's position on climate change over time has been largely shaped by how it conceptualised its overall national interest and its contribution to causing climate change. Even today, according to some estimates, nearly one-fourth of the population in India is considered 'poor' and unable to fulfil basic needs. India's primary domestic goal after gaining independence in 1947 has been to alleviate poverty and improve the living standards of people and achieve

¹⁸ United Nations, Report of the Conference of the Parties on its First Session, held at Berlin, from 28 March to 7 April, 1995, FCCC/CP/1995/7/Add.1, 6 June 1995, <https://unfccc.int/resource/docs/cop1/07a01.pdf>

¹⁹ United Nations, "Kyoto Protocol to the United Nations Framework Convention on Climate Change", 1998, <https://unfccc.int/resource/docs/convkp/kpeng.pdf>

modernisation and development. Consequently, India strongly and consistently opposed any ideas of an international agreement that could deprive it of energy use, economic growth, and development, and hinder its core national interest and future development prospects. The Indian delegation, represented by members of the Ministry of Environment and Forests (MoEF) (now called Ministry of Environment, Forests and Climate Change (MoEFCC)) of the Government of India, reiterated during COP 5 in Bonn in 1999 that economic development and poverty eradication are the primary priorities of India and other developing countries which would understandably contribute to the growth of GHG emissions.²⁰

India emerged as one of the key brokers representing G77 and bringing other groupings of countries together at negotiation forums. India, therefore, in the initial phase, was among the pioneers who formulated important concepts such as “common but differentiated responsibilities” (CBDR) which became one of the core principles of the UNFCCC (Article 3 of the Convention)²¹ sought to bring out the diverse national interests and historical responsibilities of developed and developing countries. The differences in capabilities of nations to adapt to climate change impacts, due to differences in economies and different levels of vulnerability to climate change, were also put highlighted by India along with developing countries. This concern was addressed through the phrase ‘respective capabilities’ (RC) in Article 2 of the Convention,²² which has underpinned the climate change negotiations.

2.1.2. Phase II: Road to Copenhagen Summit

The Third Assessment Report (AR3) of the IPCC, published in 2001, laid out in detail the growing impacts of climate change and emphasised on the need for adaptation. India recognised that projected climate change would have an adverse impact on food production, water supply, natural ecosystems, coastal settlements, energy security, etc. However, the adaptive capacity of India and other developing countries that are relatively more vulnerable to the impacts of climate change was weak due to limited access to resources and lack of the required technology. Furthermore, the lack of strong commitments from developed countries on emissions reduction and the adverse impacts of climate change on socio-economic conditions were likely to exacerbate the developmental challenges and have serious repercussions for developing countries. India took a strong position and urged for the transfer of technology and financial support from developed countries to developing countries to be adopted in any formal agreement on climate change. Further, India called for greater attention to adaptation funds at COP 7 in Marrakesh in 2001. ‘Climate adaptation’ was prioritised in the Marrakesh Accords and provisions were made for funding the implementation of capacity-building in and technology

²⁰ Government of India, “Shri T.R Baalu to Attend UN meet on Environment in Germany”, Press Bureau Information, Archive, <https://archive.pib.gov.in/archive/releases98/lyr99/11099/r291099.html>

²¹ United Nations, “United Nations Framework Convention on Climate Change”, FCCC/INFORMAL/84, FCCC 1997, Article 31, UNFCCC. <https://unfccc.int/resource/docs/convkp/conveng.pdf>

²² United Nations, “United Nations Framework Convention on Climate Change”, FCCC/INFORMAL/84, FCCC 1997, Article 31, UNFCCC. <https://unfccc.int/resource/docs/convkp/conveng.pdf>

transfer to developing countries. It provided additional guidance to the Global Environment Facility.²³

Interlinkages between climate change and sustainable development were discussed at the COP 8 in New Delhi in 2002. For sustainable development, it was stressed in the Delhi Ministerial Declaration that technological advancements should be encouraged through research and development, economic diversification, and strengthening of relevant regional, national, and local organisations. It was once again reiterated that Annex I Parties should implement their commitments under the Convention,²⁴ considering that the USA's decision to leave the Kyoto Protocol hampered further progress. Developed countries, particularly the USA, strongly pushed the issue of growing emissions in developing countries. Projections at the time indicated that China will surpass the USA as the world's greatest GHG emitter by 2007, and India would become the world's third-largest carbon emitter by 2015. At COP 11 in Montreal in 2005, a dual-track approach was adopted to broaden the scope of discussions and explore "long-term cooperative action" (the LCA track) with greater involvement of non-Annex I parties, as well as the Kyoto Protocol Track (the KP track), in order to discuss the Annex I Parties' post-2012 "second commitment period" mitigation targets. The 2007 Bali Action Plan (COP 13) formalised the creation of a new negotiation process and a timeline for a new international climate action plan to be completed by 2009.²⁵ India coordinated closely with other developing Parties to make sure the "agreed outcome" under the LCA track was consistent with the original framework and fundamental principles of the UNFCCC and KP.

The release of the IPCC's Fourth Assessment Report (AR4) in 2007 marked a turning point in India's approach to climate change. The report painted a grim picture for India with dire projections for the increase in frequency and intensity of extreme weather events and the adverse impacts of climatic changes on sectors such as agriculture, forestry and ecosystems, water resources, human health and industry, urban settlements and society.²⁶ In response, at the domestic level, India's approach to national climate policy was debated extensively within its Parliament. There was a growing understanding among Indian policymakers and bureaucrats that the country's vulnerabilities to the impacts of climate change should be a strong motivation to ramp up climate action at the national level and advocate the same at the global level. The need for a pathway to development that is sustainable and resilient to climate change was increasingly being discussed and advocated by academicians and think tanks.²⁷ At the same time, climate change was seen as an investment opportunity for the construction of resilient

²³ United Nations, Report of the Conference of the Parties on Its Seventh Session, Held at Marrakesh, From 29 October to 10 November 2001, FCCC/CP/2002/13, Jan 21 2002, <https://unfccc.int/sites/default/files/resource/docs/cop7/13.pdf>

²⁴ UNFCCC, "The Delhi Ministerial Declaration on Climate Change and Sustainable Development", COP 8, Decision/CP.8, 2002, https://unfccc.int/cop8/latest/1_cpl6rev1.pdf

²⁵ The UNFCCC, "Report of the Conference of the Parties on its Eleventh Session, held at Montreal from 28 Nov to 10 Dec 2005, Decision 1/CP.11 in FCCC/CP/2005/5/Add.1, 30 March 2006, <https://unfccc.int/resource/docs/2005/cop11/eng/05a01.pdf>

²⁶ IPCC, 2007: Summary for Policymakers: Climate Change 2007: Impacts, Adaptation and Vulnerability, Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press: Cambridge, (2007): 7-22.

²⁷ Susanne Jakobsen, 1998, "India's Position on Climate Change from Rio to Kyoto: A Policy Analysis, CDR Working Paper, 98, 11, Copenhagen, Centre for Development Research.

infrastructure and enhancing the country's energy security by reducing its dependence on coal and oil imports.²⁸ In 2007, India participated in the G8 summit in Germany where climate change was one of the key agenda points. Shri Manmohan Singh, India's Prime Minister at the time, indicated for the first time, flexibility in India's approach where he mentioned that India fully recognises its responsibilities as a developing country. He pledged that even as India pursues its policies for economic growth and development, "*India's per-capita GHG emissions are not going to exceed those of developed countries*".²⁹

Subsequently, the Indian government launched the 'National Action Plan on Climate Change' (NAPCC) in June 2008 which outlined a comprehensive climate action plan comprising eight key 'missions' (four more missions were added later) to "*promote development objectives while also yielding co-benefits for addressing climate change effectively*".³⁰ India also embraced the Clean Development Mechanism (CDM) after having been reluctant to carbon market-based mechanisms in the early years of the negotiations. The MoEF established the National CDM authority for "*the purpose of protecting and improving the quality of the environment in terms of Kyoto Protocol*".³¹ Soon, India became the second largest recipient of CDM projects after China. However, India's overall approach to international climate change negotiations remained unchanged.

At the landmark COP 15 in Copenhagen in 2009, developed countries, including the USA, proposed to create a new agreement asking for practical climate actions from developing countries. They argued that Kyoto Protocol should be replaced by a new, more "undifferentiated" international climate change agreement, where all major GHG emitters, both developed and developing countries, would be subject to the same levels of international scrutiny and have the same obligations for mitigating their emissions. India worked closely together through the newly created BASIC alliance to counter the increasing pressure that each of them was facing from a largely united US-led North. India's then Hon'ble Minister of Environment and Forests, Jairam Ramesh, argued that India was prepared to be flexible at the UNFCCC negotiations except for its three non-negotiable points, (a) it would not accept any legally binding emission reduction targets, (b) it would not accept any peaking year, (c) it would not allow unsupported mitigation actions to be subject to the same type of scrutiny as those that were externally supported. The BASIC countries collectively ensured that the fundamental principles of the UNFCCC, such as CBDR-RC, were acknowledged in the Copenhagen Accord. Even though COP 15 failed to reach an agreement on the future climate regime, India played a crucial role in crafting the Copenhagen Accord alongside China, Brazil, South Africa, and the USA. India was also successful in presenting a coherent position and made voluntary commitment to

²⁸ Dubash, Navroz K., Radhika Khosla, Ulka Kelkar, and Sharachchandra Lele. 2018. 'India and Climate Change: Evolving Ideas and Increasing Policy Engagement', *Annual Review of Environment and Resources*, 43: 395–424, <https://doi.org/10.1146/annurev-environ-102017-025809>

²⁹ Ministry of External Affairs, Government of India, PM's Intervention on Climate Change at the Heiligendamm Meeting", June 08 2007, <https://mea.gov.in/in-focus-article.htm?18822/PMs+intervention+on+Climate+Change+at+the+Heiligendamm+meeting>

³⁰ Government of India, Prime Minister's Council on Climate Change, National Action Plan on Climate Change, https://archivepmo.nic.in/drmanmohansingh/climate_change_english.pdf

³¹ Government of India, National Clean Development Mechanism Authority, <https://www.india.gov.in/national-clean-development-mechanism-cdm-authority>

reduce the emissions intensity of its gross domestic product (GDP) by 20-25% by 2020 in compared to its 2005 level through domestic mitigation actions (excluding the agriculture sector).³²

3.1.3. Phase III: Building up to the Paris Agreement

The period between (COP16) 2010 and (COP21) 2015 focused primarily on designing a new global climate agreement, where the developed countries led by the USA strongly advocated for replacing the Kyoto Protocol — ‘legally binding’ and strictly ‘differentiated’ — with a ‘more voluntary’, ‘less differentiated’ and ‘bottom-up’, ‘pledge and review’ kind of arrangement to push developing countries to come on board to set their voluntary emissions reduction targets. At COP 16 in Cancun in 2010, “*all parties recognised that climate change represent an urgent and potentially irreversible threat to human societies and the planet, and thus climate change needs to be urgently addressed by all Parties*”.³³ Based on this stance, COP 17 at Durban, 2011, was a turning point in the global climate change negotiations. Parties at the COP 17 began negotiations for a post-2020 agreement in the form of a protocol, another legal document, or an agreed outcome with legal force under the Convention by COP 21 in 2015. The agreement would be “*applicable to all Parties*”, essentially eliminating the Kyoto Protocol’s clear distinction between developed and developing countries. India’s then Environment, Forest, and Climate Change Minister Jayanthi Natarajan in her statement in Durban 2011, stated that climate change is the most pressing and serious challenge for India as well. She went on to say, that “*as a developing country, the principles of equity and CBDR are central for us. India is asking for space for basic development for its people and poverty eradication*”. She furthered emphasised that India cannot accept the principle of CBDR to be diluted; the firewall of CBDR must not be broken, equity in the debate must be secured.³⁴ Despite repeated opposition by India and other developing countries, no clear distinction between developed and developing countries was made in the Durban outcome. Unlike the Copenhagen Accord and the Cancun Agreements, the Durban Platform made no mention of the critical UNFCCC principles of “equity” and “CBDR&RC”. However, at same time, no legally enforceable instrument was rendered “universally applicable”.

The COP 18 in Doha in 2012 initiated a new phase in which all the major climate issues were addressed in a single track with the goal of reaching a new comprehensive legal agreement that would be “application to all” beginning in 2020. India and other developing countries pushed developed Parties to strengthen their mitigation commitments and adopt stronger mechanisms to address finance, transparency, and technology. India along with the Least Developed Countries and Small Island Developing States re-emphasised the inclusion of ‘loss

³²Sandeep Sengupta, “India’s Engagement in Global Climate Negotiations from Rio to Paris”, In Navroz K. Dubash (ed.), *India in a Warming World: Integrating Climate Change and Development*, Delhi: Oxford Academic, 19 Dec. 2019, <https://doi.org/10.1093/oso/9780199498734.003.0007>

³³UNFCCC, “Report of the Conference of the Parties on its Sixteenth Session, held in Cancun from 29 November to 10 December 2010, FCCC/C/2010/7/Add.1 <https://unfccc.int/resource/docs/2010/cop16/eng/07a01.pdf>

³⁴ Centre for Science and Environment, Indian Environment Minister Jayanthi Natarajan Gives Hard Hitting Speech, Receives Standing Ovation”, COP 17, Durban, Indaba Session, December 10 2011, <https://www.cseindia.org/-indian-environment-minister-jayanthi-natarajan-gives-hard-hitting-speech-receives-standing-ovation-3556>

and damage’ into the new agreement, stating that the “*mechanism for addressing loss and damage must be taken to its logical conclusion*”.³⁵ Subsequently at COP 19 in 2013, the parties established the Warsaw International Mechanism for Loss and Damage. In an important development, at COP 19, *all* parties to the UNFCCC were invited to prepare and submit Intended Nationally Determined Contributions (INDC), in the build-up to a new regime. The newly-formed group of Like-Minded Developing Countries (LMDC) and the BASIC group countered developed countries’ narrative once again on the ground of the principle of equity and differentiation and argued that the 2015 agreement ought to be consistent with the agreed founding principles of the UNFCCC, that cannot undergo ‘rewriting, revising or reinterpreting’.³⁶ At COP 20 in Lima in 2014, a formal compromise was reached on this issue, and it was decided that the 2015 agreement would represent the CBDR&RC principle “in light of varied national circumstances”. In other words, the original Rio idea of “differentiation”—defined as a clear distinction between Annex I and non-Annex I party duties and treatment—would no longer be applicable. As a result, the Paris Agreement, which was ultimately approved at COP 21 in December 2015, embraced the idea of difference inside its language in a completely different way than it had been first envisioned under the UNFCCC and the Kyoto Protocol.³⁷

At the COP21 negotiations in Paris, both the North and South divisions showed a willingness to take part in the Paris climate agreement because the agreement provided space and flexibility to determine and decide how much they wish-to and are capable-of contributing to the common collective climate action. The Paris Agreement reaffirmed the International Mechanism for Loss and Damage as the main vehicle under the UNFCCC process to address the detrimental impacts of climate change and increasing extreme weather events.³⁸ Moreover, the green climate fund which was created at the Copenhagen Summit in 2009 was distinguished as one of the instruments to facilitate and assist the flow of financial and technological needs for the implementation of INDCs in developing countries.³⁹ India warned, however, that “*simply creating the institutional arrangements like Green Climate Fund does not help as its coffers are still empty*”. India was perceived as one of the pivotal voices at COP 21; its position was in alignment with its balanced approach to meet its climate change goals while pursuing its national interest i.e., to advance its economy and improve the standard of living of its people. India’s commitment to ecologically sustainable economic development is indeed rooted in its age-old civilizational values of respecting nature, incorporating a sense of intergenerational equity and a common

³⁵ Minister of Environment and Forest, Government of India, “Opening Statement by Smt Jayanthi Natarajan Minister Environment and Forest India” at COP 19, Warsaw,

https://unfccc.int/files/meetings/warsaw_nov_2013/statements/application/pdf/cop19_hls_india.pdf

³⁶ Anil Agarwal and Sunita Narain, Anju Sharma (eds). *Green Politics: Global Environmental Negotiations*, New Delhi: Centre for Science and Environment, (1999).

³⁷ Sandeep Sengupta, “India’s Engagement in Global Climate Negotiations from Rio to Paris”, In Navroz K. Dubash (ed.), *India in a Warming World: Integrating Climate Change and Development*, Delhi: Oxford Academic, 19 Dec. 2019, <https://doi.org/10.1093/oso/9780199498734.003.0007>

³⁸ United Nations, UNFCCC, Paris Agreement under Article 8 on Dimension of Loss and Damage, <https://unfccc.int/topics/adaptation-and-resilience/the-big-picture/introduction-to-loss-and-damage>

³⁹ United Nations, Report of the Conference of the Parties to its fifteenth session, held in Copenhagen from 7 to 19 December, 2009, FCCC, CP/2009/11/Add.1 30 March 2010, <https://unfccc.int/process-and-meetings/conferences/past-conferences/copenhagen-climate-change-conference-december-2009/copenhagen-climate-change-conference-december-2009>

humanity. India signed the Paris Agreement in 2015 and ratified the agreement in October 2016 and positioned itself as a responsible global player in the fight against climate change.

2.2. INDC: India's Deliverables to the UNFCCC

India submitted its INDCs to the secretariat of the UNFCCC shortly before COP 21 in 2015. The INDCs outlined the post-2020 climate actions they intended to take under a new international agreement. India's approach to INDC has been inspired by Mahatma Gandhi's famous quote, *"Earth has enough resources to meet people's needs, but will never have enough to satisfy people's greed"* and was formulated under the leadership of Prime Minister, Narendra Modi.⁴⁰ According to the Ministry of Environment, Forest and Climate Change, India's INDC were formulated through an inclusive consultative approach along with different stakeholders, including civil society organisations, think tanks, and technical and academic institutions with specific involvement of the key Ministries and State Governments. In the INDC, India pledged to, (i) reduce the 'emissions intensity' of its GDP by 33-35 per cent by 2030, below 2005 levels, (ii) increase the share of non-fossil fuels-based electricity to 40 per cent by 2030 with the help of the transfer of technology and low-cost international finance mechanisms, such as the Green Climate Fund, and (iii) create an additional carbon sink of 2.5 to 3 billion tonnes of CO₂ by 2030. India's Union Minister of Environment, Forest and Climate Change, Shri Prakash Javadekar, stated that *"India is keen to attempt to work towards a low carbon emission pathway, while simultaneously endeavouring to meet all the developmental challenges that the country faces today"*. India's INDC was focused on India's policies and programmes on the *"promotion of clean energy, especially renewable energy, enhancement of energy efficiency, development of less carbon-intensive and resilient urban centres, promotion of waste to wealth, safe, smart and sustainable green transportation network, abatement of pollution and India's efforts to enhance carbon sink through the creation of forest and tree cover."*⁴¹ Further, the Government of India stressed that the *"INDC is balanced and comprehensive as it included adaptation, mitigation, climate finance, technology transfer and capacity building"*. It was also fair and ambitious because India is attempting to follow a low carbon emission pathway while addressing its developmental needs.

To achieve the communicated Nationally Determined Contributions, several new initiatives have been launched in the following priority areas:⁴²

- (a) Introducing new, more efficient, and cleaner technologies in thermal power generation
- (b) Promoting renewable energy generation and increasing the share of alternative fuels in the overall fuel mix
- (c) Reducing emissions from the transportation sector
- (d) Promoting energy efficiency in the economy, notably in industry, transportation buildings and appliances
- (e) Reducing emissions from waste
- (f) Developing climate resilient infrastructure

⁴⁰ Government of India, Ministry of Environment, Forest and Climate Change, Press Information Bureau, <https://pib.gov.in/newsite/printrelease.aspx?relid=128403>

⁴¹ Ibid

⁴² UNFCCC, India INDC to UNFCCC: India's Intended Nationally Determined Contributions: Working Towards Climate Justice, <https://unfccc.int/sites/default/files/NDC/2022-06/INDIA%20INDC%20TO%20UNFCCC.pdf>

- (g) Full implementation of Green India Mission and other programmes of afforestation
- (h) Planning and implementation of actions to enhance climate resilience and reduce vulnerability to climate change

2.2.1. India's Net Zero Pledge at Glasgow Climate Summit

As a part of the 'ratchet mechanism' under the Paris Agreement, all parties were expected to submit their revised, more ambitious INDCs by COP26 in Glasgow in 2021. At the Summit, Prime Minister Narendra Modi promulgated India's updated INDCs which for the first time included a timeline to achieve 'net-zero' emissions. The five updated commitments (referred to by the PM as *Panchamrit* or five nectar elements) were as follows:⁴³

- (a) India will take its non-fossil energy capacity to 500 GW by 2030
- (b) India will meet 50 percent of its energy requirements from renewable energy by 2030
- (c) India will reduce the total projected carbon emissions by one billion tonnes from now till 2030
- (d) By 2030, India will reduce the carbon intensity of its economy by more than 45 per cent
- (e) By the year 2070, India will achieve the target of Net Zero

The successful implementation of the INDC is dependent on the additional means of implementation, such as technology transfer, capacity building, climate funding to be provided by developed countries as laid down in Articles 3.1 and 4.7 of the UNFCCC. Prime Minister Narendra Modi also stated that "*while we all are raising our ambitions on climate action, the world's ambitions on climate finance cannot remain the same as they were at the time of the Paris Agreement*". He stressed that developed nations must increase aid to developing nations and mobilise climate finance of at least USD 1 trillion, and that progress in climate finance commitments should be tracked in the same way as the progress of climate mitigation commitments.⁴⁴

2.3. India's Efforts Towards Promoting International Cooperation on Climate Change Mitigation and Adaptation

In addition to its efforts within the UNFCCC framework, India has been actively working towards enhancing multilateral and bilateral cooperation on climate change as part of its foreign policy, economic policy and diplomacy frameworks. For instance, India has been an active member of consultative mechanisms such as the BASIC Ministerial Meeting on Climate Change. It has been actively coordinating the positions of various countries in the negotiations on climate change, and playing an essential role in maintaining unity among developing countries and safeguarding their common interests. India also actively participates in negotiations through the Group of 20, the International Civil Aviation Organisation, the International Maritime

⁴³ Ministry of External Affairs, Government of India, "National Statement by Prime Minister Shri Narendra Modi at COP 26 Summit in Glasgow, November 02 2021, <https://www.mea.gov.in/Speeches-Statements.htm?dtl/34466/National+Statement+by+Prime+Minister+Shri+Narendra+Modi+at+COP26+Summit+in+Glasgow>

⁴⁴ Ibid

Organisation, and the BRICS meeting, in promoting synergy among multiple channels and multilateral processes. India is also party to the Convention on Biological Diversity (CBD), the Sendai Framework for Disaster Risk Reduction, and the United Nations Convention to Combat Desertification (UNCCD).⁴⁵ In 2021, India officially joined the High Ambition Coalition for Nature and People, a group of over 70 countries that aims to protect and conserve 30% of the world's terrestrial, freshwater, coastal and marine ecosystems, becoming the first of the five BRICS countries to join the coalition.⁴⁶

In recent years, India has emerged as a highly active contributor to international cooperative climate action measures and in fact a pioneer in several cases. For instance, India launched the International Solar Alliance (ISA) along with France at the COP 21 on 30 Nov 2015, to accelerate the global adoption of solar energy. The alliance has 121 nations which are located between the Tropic of Cancer and the Tropic of Capricorn. *"The vision and mission of the ISA are to provide a platform for cooperation among the members... to make a positive contribution to assist and help achieve the common goals of increasing the use of solar energy in meeting energy needs of prospective ISA member countries in a safe, convenient, affordable, equitable and sustainable manner".*⁴⁷ The ISA is committed to establishing solar as a shared solution that can address climate change and advance economic development across the geographies at the same time. Prime Minister Narendra Modi during the first Assembly of the International Solar Alliance at Vigyan Bhawan in 2018, stated that the *"Solar Alliance is a great forum to work towards ensuring climate justice"*.⁴⁸ The International Solar Alliance and Elsevier launched an open-access journal called "Solar Compass", as an important tool to support the rapid increase in solar energy use around the world through the exchange of ideas, scientific research, technological developments, and policy-related solutions. At Glasgow on 2nd Nov 2021, the UK Presidency of COP 26 and Indian Presidency of ISA, launched the 'Green Grids Initiatives – One Sun One World One Grid' (GGI-OSOWOG).⁴⁹

Prime Minister Narendra Modi at the UN Climate Action Summit in New York on 23 September 2019, launched the international Coalition for Disaster Resilient Infrastructure (CDRI) envisaged as a multi-stakeholder global partnership of national governments, UN agencies and programmes, multilateral development banks and financing mechanisms, the private sector, and academic and knowledge institutions. The formation of the international coalition was the result of efforts made by India which began in 2016 at the Asian Ministerial Conference on Disaster Risk Reduction in New Delhi when India called for cooperative action to reduce damage to critical infrastructure. Indeed, India has consistently laid great emphasis on disaster risk management in all international bilateral and multilateral forums. The mission of the CDRI is to support countries to upgrade their systems and enhance the disaster and climate

⁴⁵ Government of India, "India Joins High Ambition Coalition (HAC) for Nature and People", PIB, Oct 7, 2021. <https://pib.gov.in/PressReleaseDetail.aspx?PRID=1761855>.

⁴⁶ Ministry of External Affairs, "Indo-Pacific Division Briefs", Feb 7, 2020.

⁴⁷ Ministry of New and Renewable Energy, Government of India, Press Information Bureau, "PM Inaugurates First Assembly of the International Solar Alliance", 02 Oct 2018, <https://pib.gov.in/Pressreleaseshare.aspx?PRID=1548295>

⁴⁸ Ibid

⁴⁹ Ministry of Environment, Forest and Climate Change, "The United States of America becomes the 101st Member Country of the International Solar Alliance", 10 November, 2021, Press Information Bureau, <https://pib.gov.in/PressReleasePage.aspx?PRID=1770688>

resilience of existing and future infrastructure. It seeks to rapidly expand the development and retrofitting of resilient infrastructure and to increase the availability of technical assistance to meet international commitments under the Paris Agreement, the Sendai Framework for Disaster Risk Reduction, and the Sustainable Development Goals. The CDRI aims to address common challenges and provide access to best practices to develop better standards as well as regulatory mechanisms to manage infrastructure development in a manner that fosters resilience particularly for developing countries that are in the early stages of infrastructure development. As of August 2022, the CDRI has 31 member countries and 8 international entities (including UN agencies, development banks, etc.)

India recognises that robust multilateral cooperation is the only way to address complex, interconnected issues such as climate change. International cooperation is also necessary to mobilise political, technical, and financial support on sub-regional, regional, and international scales by focusing on locally coordinated initiatives driven by specific needs. Some of the other key initiatives that are also relevant in the context of cooperation on climate change and where India plays an active role include: Indian Ocean Rim Association (IORA), the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC), the Mekong-Ganges Cooperation Initiative, the Arctic Council, the Leadership Group for Industry Transition (LeadIT Group), and the most recent Indo-Pacific Ocean Initiative (IPOI) which was introduced by Prime Minister Narendra Modi at the East Asia Summit in 2019.

India, at the bilateral level, has established green partnerships with the UK, the USA, Denmark, France, Norway, and Australia. In May 2021, the 2030 Roadmap for Future India-UK Relationship was released and indicated that they will jointly lead global climate action through the UK-India Forest Partnership, the Climate Finance Partnership, the Indo-UK Green Hydrogen Partnership, and the Indo-UK Green Energy Partnership.⁵⁰

India has also been working towards building collaborative approaches for a national and regional Blue Economy. In 2020, India's Hon'ble Minister for Earth Sciences, Harsh Vardhan and Norway's Hon'ble Minister for Climate and Environment, Sveinung Rotevatn, announced the India-Norway Task Force on Blue Economy for Sustainable Development. They jointly initiated a new collaboration on Integrated Ocean Management and Research.⁵¹ The Indo-Norwegian cooperation aimed to focus on improving open space management, reducing plastic pollution, and reducing emissions from shipping and ports.⁵² Likewise, India and France have also acknowledged the vital role that the ocean plays in combating climate change, preserving biodiversity, and supporting economic development. Both countries agreed to work together

⁵⁰ Government of India and UK, "2030 Roadmap for India-UK future relations", May 2021, <https://www.gov.uk/government/publications/india-uk-virtual-s>

⁵¹ Government of India, Ministry of Earth Science, "India and Norway Strengthen Partnership on Blue Economy", Press Information Bureau, 18 Feb 2020, <https://pib.gov.in/newsite/PrintRelease.aspx?relid=199414>

⁵² Norway in India, Royal Norwegian Embassy in New Delhi, 2022, <https://www.norway.no/en/india/norway-india/news-and-events/new-delhi/news/india-norway-blue-economy-collaborative-model-is-good-for-economic-growth-climate-and-marine-environment/>

and adopted the India-France Roadmap on the Blue Economy and Ocean Governance in February 2022.⁵³

India continues to voice the climate-related concerns of developing countries and provide climate assistance to other countries where it can, in areas such as finance, technical equipment and scientific and technological cooperation. In November 2014, the Prime Minister of India visited Fiji and announced an increase in non-reimbursable assistance to USD 200,000 to support Pacific Island countries in addressing climate change, and pledged to establish a Climate Resilience Fund to strengthen mechanisms for climate change adaptation in Pacific Island countries. The third MOU between India and Fiji provides a USD 70 million line of credit for Fiji to support cooperation in the construction of power stations, which will help address climate change issues in Fiji and expand the scope of bilateral cooperation. In 2020, India committed a further FJD 1.8 million for Fiji's development of climate disaster risk financing through the India-UN Development Partnership Facility.⁵⁴

3. Overview of India's Domestic Climate Action Policies

3.1. National and State Action Plans on Climate Change

India's environment policy is anchored in the constitution of India wherein Article 48-A states that "*the State shall endeavour to protect and improve the environment and to safeguard the forests and wildlife of the country*".⁵⁵ The Indian development process is guided by the aspiration of making India prosperous and progress on the path of "Development without Destruction". The broad policy framework on the environment and climate change was laid down by the National Environment Policy (NEP) 2006, which promotes sustainable development along with respect for ecological constraints and the imperatives of social justice. The current development paradigm reiterates the focus on sustainable growth and aims to exploit the co-benefits of addressing climate change along with promoting economic growth. The National Action Plan on Climate Change (NAPCC) of 2008 outlined a comprehensive action plan to tackle the complex issue of climate change.⁵⁶ The original action plan was divided into eight main "*National Missions*" dealing with different facets of sustainable development, conservation of natural ecosystems, climate change mitigation and adaptation. Over the years, the plan underwent revisions considering new scientific information and technological advances; several new missions were identified and added to the NAPCC. Table 1 summarises all existing missions under the NAPCC, their objectives, and status of implementation.

⁵³ Government of India, Ministry of External Affairs, India-France Roadmap on the Blue Economy and Ocean Governance", Feb 20 2022, https://www.mea.gov.in/bilateral-documents.htm?dtl/34882/INDIAFRANCE_ROADMAP_ON_THE_BLUE_ECONOMY_AND_OCEAN_GOVERNANCE

⁵⁴ The Fiji Government, "India Pledges FJ \$1.8 Million Towards Developing Climate Disaster Risk Financing in Fiji", Aug 2020, [https://www.fiji.gov.fj/Media-Centre/News/INDIA-PLEDGES-FJ\\$1-8-MILLION-TOWARDS-DEVELOPING-CL](https://www.fiji.gov.fj/Media-Centre/News/INDIA-PLEDGES-FJ$1-8-MILLION-TOWARDS-DEVELOPING-CL).

⁵⁵ India INDC to UNFCCC, India's Intended Nationally Determined Contributions: Working Towards Climate Justice, <https://unfccc.int/sites/default/files/NDC/2022-06/INDIA%20INDC%20TO%20UNFCCC.pdf>

⁵⁶ Prime Minister's Council on Climate Change, Government of India, "National Action Plan on Climate Change", https://archivepmo.nic.in/drmanmohansingh/climate_change_english.pdf

The NAPCC also urged all the states and union territories to devise their own individual “State Action Plans on Climate Change” (SAPCC) to complement the NAPCC and identify state-level initiatives and measures to address climate change. Accordingly, since 2008 all states and union territories produced and adopted their own SAPCCs. SAPCCs serve as the primary policy document at the sub-national level to address vulnerabilities and take action to respond to the effects of climate change in each state. Importantly, most SAPCCs have laid specific emphasis on climate change adaptation in addition to mitigation of greenhouse gas (GHG) emissions. In this context, several pilot adaptation projects are being implemented with funds allocated by agencies and by the central government under the National Adaptation Fund on Climate Change (NAFCC). The NAFCC projects have been implemented in the states of Kerala, Tamil Nadu, and Andhra Pradesh in relation to coastal protection activities. Over 30 adaptation projects have been approved in 27 States and UTs so far. Additionally, several programmes with a specific focus on adaptation in the agriculture sector have also been implemented under the National Initiative on Climate Resilient Agriculture (NICRA). Of course, the implementation of the broad policy initiatives and programmes of the central and state governments is greatly facilitated by the involvement of Non-Governmental Organisations (NGOs), civil society groups, private companies, and other stakeholders.

While India announced a set of more ambitious emission reduction targets and joined the global bandwagon by announcing a net zero goal by 2070, it requires climate funding, technological capacity, and resources to fight climate change at the rate that the world requires now. To meet its climate goals India has undertaken several initiatives at the domestic level in terms of climate finance by establishing the National Adaptation Fund, introducing reduction in fossil fuel subsidies, and tax-free infrastructure bonds for renewable energy and increase in coal cess from INR 50 to INR 200 per ton.

Table 1: Summary of the National Missions under the National Action Plan on Climate Change of the Government of India.

Source: Compiled by authors from several sources.

Mission	Objective	Primary Implementing Entity	Status of Implementation
National Solar Mission	Enhance solar power energy and increase the share of solar energy in India's energy mix.	Ministry of New and Renewable Energy	Several schemes have been launched to promote solar power installation in the country such as the Solar Park Scheme, VGF Schemes, CPSU Scheme, Defence Scheme, Canal bank & Canal top Scheme, Bundling Scheme, Grid Connected Solar Rooftop Scheme etc. As of June 2022, India's cumulative installed solar capacity was at around 57 GW. Various policy measures have been undertaken, for e.g., the Solar Energy Corporation of India (SECI) was established as a major procurement agency.

			<p>A renewable energy corridor was also launched to develop a dedicated transmission grid for areas with an abundance of sunlight or strong wind to create solar and wind energy. Guidelines have been developed for creation of smart cities, building bye-laws have been amended for mandatory provision of roof top solar for new construction projects. Solar radiation monitoring stations have been set up across the country.</p>
National Mission for Enhanced Energy Efficiency	10,000 MW of Energy Efficiency savings by 2020.	Ministry of Power; Bureau of Energy Efficiency (BEE); Energy Efficiency Services Limited (EESL)	<p>Four mechanisms have been adopted to promote energy efficiency in energy-intensive industries: Perform, Achieve, Trade (PAT), Market Transformation for Energy Efficiency (MTEE), Energy Efficiency Financing Platform (EEFP) and Framework for Energy Efficient Economic Development (FEEED).</p> <p>Measures have been taken to promote technology upgradation and modernisation of Micro, Small, Medium Enterprises (MSME) to improve the energy efficiency and promote innovations.</p> <p>As part of the Unnat Jyoti by Affordable LEDs for All (UJALA) scheme, as of November 2020, more than 366.85 million LED bulbs, 7.207 million LED tube lights, and 2.340 million energy-efficient fans were delivered throughout India.</p> <p>Under the Street Lighting National Program (SLNP), until September 2020, the Energy Efficiency Services Ltd (EESL) deployed more than 11.25 million LED systems.</p> <p>In the construction sector, Energy Efficiency Services Ltd (EESL) implemented the Buildings Energy Efficiency Programme (BEEP) to retrofit commercial building into energy efficient complexes.</p> <p>Energy conservation norms have been issued for residential buildings under the Energy Conservation Building Code programme (ECBC). Building-energy rating system called Green Rating for Integrated Habitat Assessment (GRIHA) has been developed based on 34 criteria such as site planning, conservation, efficient utilisation of resources, etc.</p>
The Wind Mission	Increase production of wind energy in India.	Ministry of New and Renewable energy (MNRE)	<p>National Institute of Wind Energy (NIWE) was established by MNRE at Chennai as an autonomous R&D institution. NIWE has been actively involved in various national initiatives, such as Carbon Neutral Ladakh, Green Energy Islands (Andaman and Nicobar Islands, Lakshadweep), and the Renewable Energy Park in Kutch. NIWE has successfully completed the geo-technical investigations at Gulf Khambhat, off Gujarat coast and Gulf of Mannar, off Tamil Nadu coast, to estimate wind energy capacity. A Wind Turbine Test Station has been established at Kayathar, Tamil Nadu.</p>

National Water Mission	Ensure integrated water resource management to conserve water, minimise wastage, and ensure equitable distribution both across and within states. Increase water use efficiency by 20 per cent.	Ministry of Water Resources	<p>Large-scale programmes such as the Neeranchal National Watershed Project and National Mission for Clean Ganga, have been implemented. A National River Conservation Directorate was established.</p> <p>Pilot climate change risk assessments were conducted for 3 river sub-basins, Sutlej, Chambal, and Cauvery-Delta.</p>
National Mission for Sustaining the Himalayan Ecosystem	Prevent the melting of Himalayan glaciers. Ensure conservation and protection of biodiversity, wildlife and forest, and mountain the ecosystem. Create and promote traditional knowledge societies.	Ministry of Science and Technology	<p>A National Mission on Himalayan Studies was launched. Climate Change Cell on Himalayan Ecosystem has been created to regulate natural geological snow and glaciers, forest resources and plant diversity, Himalayan agriculture, micro flora and fauna, wildlife and animal population, and traditional knowledge systems.</p> <p>A comprehensive Climate Vulnerability Assessment was conducted for the Himalayan Region.</p>
National Mission for a Green India	<p>Increase forest and tree cover to the extent of 5 million hectares and improve quality of forest/tree cover on another 5 hectare of forest/non-forest lands.</p> <p>To improve and enhance ecosystem services like carbon sequestration and storage and increase natural ecosystem services. Increase resilience of forest-dependent communities.</p>	<p>Ministry of Environment, Forests and Climate Change (MoEFCC); National Afforestation Programme (NAP); Compensatory Afforestation Fund Management and Planning Authority (CAMPA)</p>	<p>Green India Mission was launched in 2015 and implemented at both national and state levels.</p> <p>The Forest (Conservation) Act, 1980 laid the foundation for protection and conservation for the country's natural forests. The Compensatory Afforestation Fund Act 2016 was adopted to make compensatory afforestation mandatory in case of diversion of forest land to non-forestry use.</p> <p>29 State Forest Department Agency projects totalling INR 38.20 billion have been operating under the National Afforestation Programme to treat an area of 2.19 million ha. Under the Green India Mission, World Bank-funded Ecosystems Service Improvement Project (ESIP) is being implemented in two states, namely Chhattisgarh and Madhya Pradesh.</p>

National Mission for Sustainable Agriculture	Make agriculture more productive, sustainable, remunerative and climate resilient. Enhance food security and protection of resources such as land, water, and biodiversity.	Ministry of Agriculture; National Advisory Committee (NAC); State Departments of Agriculture	<p>National Innovations in Climate Resilient Agriculture (NICRA) project was launched in 2011 by the Indian Council of Agricultural Research (ICAR), comprising four components, strategic research, technology demonstration, capacity building, and sponsored/ competitive grants. Following major programmes have been introduced to meet the targets of the mission,</p> <ul style="list-style-type: none"> (a) Rain-fed Area Development (RAD) (b) On-Farm Water Management (OFWM) (c) Soil Health Management (d) Climate Change and Sustainable Agriculture: Monitoring, Modelling and Networking (CCSAMMN). (e) National Bamboo Mission <p>A sub-mission entitled Sub-Mission on Agro-Forestry (SMAF) was launched which introduced six programmes at different levels,</p> <ul style="list-style-type: none"> (a) National Food Security Mission, (b) Rashtriya Krishi Vikas Yojana (RKVY), (c) National Mission on Oilseeds and Oil Palm, (d) Mission for Integrated Developed, (e) Mission for Integrated Development of Horticulture, (f) Pradhan Mantri Krishi Sichayee Yojana (PMKSY) <p>A National Agroforestry Policy (NAP) was adopted to protect, stabilize, and promote the resilience of natural ecosystems.</p> <p>Ministry of Agriculture and Farmers Welfare introduced Zero Budget Natural Farming (ZBNF) to promote organic farming and reduce the use of chemicals and pesticides. Several states including Karnataka, Himachal Pradesh, Kerala, Andhra Pradesh, have implemented ZBNF. Paramparagat Krishi Vikas Yojana was launched in 2015 to increase organic farming; 45,863 hectares have been transformed for organic farming in North-East Region.</p>
National Mission on Strategic Knowledge for Climate Change	Build a vibrant and dynamic knowledge system that would inform and support national action plans for sustainable development and climate response.	Department of Science and Technology; Ministry of Earth Sciences (MoES)	<p>A network of 127 institutions called the Indian Network on Climate Change Assessment (INCCA) and several Climate Change Centres such as the Indian Climate Research Programme (ICRP) have been created. The Skill India initiative was launched and the National Training Policy was implemented.</p> <p>Institutions under the Department of Science and Technology and Ministry of Earth Sciences such as Indian Institute of Tropical Meteorology (IITM), the National Physical Laboratory (NPL), the Indian Meteorological Department (IMD), the National Centre for Medium Range Weather Forecasting (NCMRWF), the National Centre for Antarctica and Ocean Research (NCAOR), the Central Leather Research Institute (CLRI), National Institute of Oceanography (NIO), the National Environmental Engineering Research Institute (NEER), among others, contribute to research on climate change in India and</p>

			formulate India's "national communications to the UNFCCC".
Health Mission	Attainment of universal access to equitable, affordable, and quality health care services, accountable and responsive to people's needs, with effective inter-sectoral convergent action to address the wider social determinants of health.	Ministry of Health and Family Welfare; National Health System Resource Centre; National Institute of Health and Family Welfare	<p>The mission has two sub-missions, National Rural Health Mission (NRHM) and National Urban Health Mission (NUHM). The National Institute of Health and Family Welfare (NIHFW) was established as an apex body for all training needs for public health education and development of skills in public health management.</p> <p>The mission focuses on five major components namely, Health System Strengthening, Reproductive, Maternal, Neonatal-Child and Adolescent Health (RMNCH+A) and Communicable and Non-Communicable Diseases.</p> <p>Six major instruments of financing and support to states have been introduced,</p> <ul style="list-style-type: none"> (a) NRHM-RCH Flexipool (b) NUHM Flexipool (c) Flexible Pool for Communicable Diseases (d) Flexible Pool for Non-Communicable Diseases, Injury and Trauma (e) Infrastructure Maintenance <p>Programmes such as the Integrated Disease Surveillance Programme (IDSP) and National Vector Borne Disease Control Programme (NVBDCP) have been introduced.</p>
Coastal Regions and Islands Mission	Build national capacity for the implementation of comprehensive coastal management plans and improved coastal governance through ecological management, conservation, and protection of critical habitats, coastal geomorphology, and geology of coastal and marine areas.	Ministry of Environment, Forests and Climate Change; Society of Integrated Coastal Management (SICOM) which is a technical arm of MoEF&CC	Vulnerable coastal areas have been identified and demarcated under Coastal Regulation Zones (CRZ) to restrict the expansion of industries and other disruptive activities. National Centre for Sustainable Coastal Management was established at Chennai, for protection, conservation, rehabilitation and management, and policy design of coastal regions. The mission is working in collaboration with 14 identified coastal research institutions. Shoreline change mapping and sediment cell mapping of the entire coast has been completed. Embankments were built in several vulnerable areas to prevent coastal erosion. About 39 multipurpose cyclone shelters have been built in Odisha and West Bengal. Biodiversity conservation initiatives such as Mangroves for the Future (MFF) was adopted in coordination with the International Union for Conservation of Nature (IUCN) in India.
Waste-to-Wealth Mission	Identify, develop and deploy technologies to treat waste to generate energy,	Prime Minister's Science, Technology, and Innovation	The mission is being implemented in conjunction with the <i>Swachh Bharat</i> Mission and the Smart Cities Project. Several projects related to treatment of biomedical waste, municipal solid waste, organic waste, and waste-water, have been implemented across India.

	<p>recycle materials, and extract wealth. The mission will also work to identify and support the development of modern technologies that promise to create a clean and green environment.</p>	<p>Advisory Council</p>	<p>As of September 2020, a total of 216 waste-to-energy facilities with a combined capacity of 370.45 MWeq have been built to use municipal, industrial, and agricultural solid wastes to produce electricity, biogas, or bio-CNG. The Ministry of New and Renewable Energy (MNRE) is leading a programme on energy recovery from wastewater and other industrial and municipal wastes.</p>
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3.2. India's Push for Renewable Energy

India's pledge to achieve net zero emissions by 2070 and to meet 40 per cent of its electricity needs through renewable energy sources by 2030 marks a significant step forward in global climate action. Fossil fuel-based energy has served as the bedrock of India's economic growth and development in the past decades. Now India is actively pursuing a low carbon development pathway and attempting to sidestep the carbon-intensive model that was previously followed by developed countries in the West. Indeed, India has adopted a slew of policy measures, programmes, and incentives to accelerate the development of the renewable energy sector and ultimately decouple its economic growth from greenhouse gas emissions. In 2010, India launched the National Solar Mission under the NAPCC. In 2015, India announced one of the largest renewable energy expansion programmes with a target of achieving 175 GW of renewable energy capacity by 2022 and later up to 450 GW to meet its voluntary NDCs to the UNFCCC. The renewable energy target of 175 GW by 2022 is expected to result in the abatement of 326.22 million tons of CO₂ eq. /year.⁵⁷

India's installed renewable energy capacity increased by around 2.6 times from 35 GW in March 2014 to 92.54 GW in January 2021 and constitutes over 24 per cent of the total installed power capacity.⁵⁸ With the inclusion of hydropower energy, the total share of renewable energy installed capacity constitutes over 36 per cent of the total capacity. India's solar power capacity has increased by more than 21 times since 2015 from 2,630 MW to 57,705 MW in June 2022.⁵⁹ Renewable electricity is growing more rapidly in India than in any other large economy, it is expected to be double by 2026. Globally, India ranks 4th in installed renewable energy capacity, 4th in wind power, and 5th in solar power capacity.⁶⁰ The establishment of world's largest solar park (encompassing 14,000 acres, with a 2.25 GW capacity) in Bhadla, Rajasthan, Cochin

⁵⁷ Ministry of Environment, Forest and Climate Change, Government of India, "India's Intended Nationally Determined Contribution is Balanced and Comprehensive", Press Information Bureau, 02 Oct 2015, <https://pib.gov.in/newsite/printrelease.aspx?relid=128403>

⁵⁸ Ministry of New and Renewable Energy, Annual Report 2020-2021.

⁵⁹ PTI, India's installed solar power capacity touches 57,705 MW: Khuba", Energyworld from the Economic Times, 21 July 2022. Retrieved from <https://energy.economicstimes.indiatimes.com/news/renewable/indias-installed-solar-power-capacity-touches-57705-mw-khuba/93031778>.

⁶⁰ Ministry of New and Renewable Energy, Annual Report 2020-2021.

International Airport becoming the world's first airport that is entirely powered by solar energy, and one of largest solar rooftop systems at Mumbai's Brabourne Stadium are instances of India's expanding efforts in the renewable energy field. Some of the other initiatives introduced by the government are offshore wind energy projects off the coasts of Gujarat and Tamil Nadu, renewable energy park of 10 GW capacity planned in Ladakh, the Waste to Energy (WTE) programme to set up 5000 compressed bio-gas (CBG) plants by 2023-24 with the production target of 15 MMT of BioCNG, *Pradhan Mantri Kisan Urja Suraksha evam Utthan Mahabhyan* (PM KUSUM), Roof Top Solar (RTS) Programme, Solar Parks, Green Energy Corridors, and Greening of Islands.

India has set ambitious targets in the transport sector as well, which is of course a significant energy consumer, such as decarbonisation of the Indian railways network by 2030 and at least 30 per cent of all new vehicles sold to be electric by 2030.⁶¹ The department of Heavy Industry is administrating the Faster Adoption and Manufacturing of (hybrid) and Electric Vehicles (FAME) India scheme for the promotion of electric/hybrid vehicles with government incentives of about INR 3,590 million, without any significant support from developed countries in terms of climate finance, technology transfer or capacity building.⁶² In line with the efforts towards producing clean energy and alternative fuels for heavy transportation, the Government of India launched the National Hydrogen Energy Mission in 2021, comprising *"a basket of measures to support production and utilisation of Green Hydrogen, support for indigenous manufacturing, research & development, pilot projects, enabling policies and regulations, and infrastructure development."*⁶³ The National Electric Mobility Mission Plan 2020, hydrogen-fuel bus and car projects in Leh and Delhi, India's first solar-powered ferry *"Aditya"* in Kerala, and flying transport aircraft with blended bio-jet fuel, all attest for India's plans to transition from fossil fuels to green sources of energy in the transportation sector.

3.3. City-level Climate Action Plans

Several Indian cities are currently in the process of creating their own climate action plans to mitigate their carbon emissions and also build resilience into the infrastructure and populations against extreme climate events. Mumbai city was the first city in India to introduce a climate action plan in 2022; it laid down a 30-year roadmap for the city to tackle climate change impacts by adopting inclusive and robust mitigation and adaptation strategies. The Mumbai Climate Action Plan (MCAP) focused its efforts on six key areas- sustainable waste management, urban greening and biodiversity, urban flooding and water resource management, energy and buildings, air quality, and sustainable mobility.⁶⁴ Under the MCAP, the city aims to achieve net-zero

⁶¹ Urmi Goswami, "India Set to Update 2030 Climate Targets Under Paris Agreement", *Economic Times*, 18 Oct 2021, https://economictimes.indiatimes.com/news/india/india-set-to-update-its-2030-climate-targets-under-paris-agreement/articleshow/87098192.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

⁶² Ministry of Environment, Forest and Climate Change, Government of India, India, First Biennial Update Report to the United Nations Framework Convention on Climate Change, India's Third National Communication to the UNFCCC, 2015.

⁶³ Ministry of New and Renewable Energy, Government of India, "National Hydrogen Mission", PIB Delhi, 31 March 2022, <https://pib.gov.in/PressReleasePage.aspx?PRID=1812023>.

⁶⁴ Mumbai, Climate Action Plan, Shaping a Climate-Forward Mumbai, <https://mcap.mcgm.gov.in/>

carbon emissions by 2050. Mumbai is among six Indian cities, including Delhi, Ahmedabad, Kolkata, Chennai, and Bengaluru, that are part of the global C40 network of cities that have committed to deliver action to tackle climate change. Other Indian cities including Coimbatore, Rajkot, Siliguri, and Udaipur, are also preparing their individual climate action plans to address the climate crisis and come up with appropriate and effective mitigating and adaptive measures.⁶⁵

Conclusion

However, India's approaches to climate mitigation and adaptation measures are often siloed, fragmented and inadequate to address the complex climate crisis which is multifaceted, compounding and systemic in nature. COVID-19 is a stark reminder of the cascading and systemic nature of the risks that are increasing in a society that is ever more interdependent and interconnected. The catastrophic (direct and indirect) impacts of COVID-19 on the health, social, economic, and financial systems that have cascaded across sectors and it was experienced by the entire world, not just India. The crisis was exacerbated by extreme weather events such as tropical cyclonic storms, heat waves, and heavy precipitation that impacted India. As a result of the unparalleled multiplier impact that various risks have on one another, it immediately affects the capacity to respond and aggravates the risk. Apart from that, a lack of resources, poor governance and accountability, and an underestimation of uncertainty in projections for climate change and societal implications, including social, economic, political, and infrastructure, limit the ability to anticipate and respond at the same time. Therefore, integrating climate change policies across all sectors is essential, as is coordination between sectors and ministries rather than operating in silos, to better manage complexity and systemic climate risk more effectively.

As India is on its pathway to achieve its long-term goal of reaching net zero by 2070. India's updated NDC represents the framework of the nation's transition from a fossil fuel-based economy to a cleaner energy-based economy. With regard to combating climate change and establishing a clean economy, India must develop trajectories different from those taken by the West in order to strike a balance between aggressive emissions reduction ambitions and economic development. However, given India is one of the most populous, largest developing countries, it would be difficult for India to achieve carbon neutrality without help in advanced scientific, technological development, and climate finance from developed countries. India would require a massive amount of investment and access to all forms of capital and technological know-how to achieve climate targets. The Union Environment Ministry stated that India will require climate finance of about USD 1trillion by 2030 to achieve its climate target.⁶⁶ So far, India's climate actions have been largely financed by domestic resources. It is also one of the agreed commitments and duties of the developed countries under the UNFCCC and Paris

⁶⁵ Deepa Padmanaban, "Climate action plans tailored to Indian cities," *Eos* 103, 06 May 2022, <https://doi.org/10.1029/2022EO220230>.

Also see: Krishnendu Bandyopadhyay, "Kolkata set to get own Climate Action Plan, 2nd City After Mumbai", *The Times of India*, 7 Jun 2022, <https://timesofindia.indiatimes.com/city/kolkata/kolkata-set-to-get-own-climate-action-plan-2nd-city-after-mum/articleshow/92049423.cms>

⁶⁶ Jayashree Nandi, "India Needs Additional \$1trillion to Achieve its Climate Goals: Government to Rajya Sabha", *Hindustan Times*, 03 December 2021, <https://www.hindustantimes.com/india-news/india-needs-additional-1-trillion-to-achieve-its-climate-goals-govt-to-raja-sabha-101638472545191.html>

Agreement to transfer technology and provide financial resources to address the global climate change crisis. The progress in this front has been slow and the goal of developed country Parties to mobilise USD 100 billion annually by 2020 has not yet been met. However, Parties recently produced a draft document at the COP 27 in Sharm El-Sheikh, Egypt, that outlines “loss and damage” financing for nations affected by climate change. The advancement of loss and damage money will decide the outcome of the negotiations in Egypt.

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