

## **An overview of climate finance in India.**

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### **Abstract**

At present the world is facing dual challenges of Covid-19 and climate change. India has been hailed as a global leader by many global leaders for its efforts to tackle the climate change and Covid-19. Climate change has several consequences on development, food and water security, health, and gender equity and poverty alleviation efforts of India. The climate financing efforts in developing countries has become an important global issue for climate governance. Climate finance is a keystone of global assistance to deal with climate change related risks. It is based in narrative that climate change is deadly, expensive, and that those least responsible for causing it are being hardest hit. Accelerating the climate finance to deal with climate change related risk still remains a key challenge in many developing countries including India. The UN Framework Convention on Climate Change (UNFCCC) involves a group of rich and developed countries to support financial assistance to developing nations to deal with climate change. This was based on the Common but Differentiated Responsibilities (CBDR) principle, which was formalized in the Earth Summit in Rio de Janeiro, 1992. India is the world's fourth-largest emitter of greenhouse gases but imparts insignificant harm. The fifth Assessment Report (AR5) of IPCC (2014) confirmed India's high vulnerability and exposure to climate change. It has also advocated that climate change will slow India's economic growth, impact health and development, make poverty reduction more difficult and diminish the food security. In Intended Nationally Determined Contribution (INDC), India has set a figure of USD 2.5 trillion (at 2014-15 prices) as its price for attaining its mitigation and adaptation targets by 2030. Apart from the making budgetary allocations, the government sustains climate action through the cuts in subsidies, increase in taxes on petroleum and diesel, market mechanisms such as Perform Achieve and Trade (PAT) and Renewable Energy Certificates (RECs) and regulatory regimes such as Renewable Purchase Obligations (RPOs). However, with high inflation and slowing growth, the country faces various major challenges like poverty, health, education, sanitization, corruption and gender differences which hinder the climate change goal. In the present review, we evaluated some of the most recent and existing mechanisms, activities and challenges of climate finance related climate finance in India.

**Keywords:** Climate change, Climate finance, IPCC, mitigation, UNFCCC

### **Introduction**

The impacts of climate change are already visible in unpredictable rainfall, rising number of cyclones and their destructive capabilities, increase in extreme weather events, glacier melting events (Reddy, P.B. 2015, 2016, 2017). In 2018, the Intergovernmental Panel on Climate Change (IPCC) underscored the fact that a raise of global temperature by  $0.5^{\circ}\text{C}$ , from  $1.5^{\circ}\text{C}$  to  $2^{\circ}\text{C}$ , would



have catastrophic effects such as hazardous heat waves and rising seas. The IPCC report has called for extraordinary efforts to lessen fossil fuel emissions to less than half in 15 years. The conversion to a low carbon-dependent world will require financing at an exceptional scale (Beck, S., & Mahony, M. (2018). The Ministry of Finance (MoF) of India guesses that it would need USD 2.5 trillion to execute its climate change actions from 2015 to 2030 (Nithin Thomas, P.(2021).

The global south (poor nations) is the major victim of the impacts of climate change as their mitigation and adaptation capabilities are very inadequate (Satterthwaite, C. M. (2008). Therefore, they depend heavily on climate finance. The target of limiting global warming below 1.5 °C is possible only with fast-paced mitigation activities. It needs heavy investments in green technology. Keeping warming below the target level requires rapid, large-scale emissions reductions, and a corresponding transition away from high-carbon production and consumption, across all sectors (Kriegler, E., et al. (2018).

India is one of the rapidly growing economies with third highest GHG emissions in the world (Timperley, J. 2019). The first ever climate change assessment report of Ministry of Earth Sciences (MoES, India) revealed that, the nation's usual temperature has already risen by 0.7°C between 1901 and 2018 due to Green House Gas (GHG) emissions and is anticipated to rise by 4.4oC by 2100 (Nithin Thomas, P. 2021). With a heavily populated 7500 km coastline is highly vulnerable to extreme weather events like sea-level rise, storms and floods. The livelihoods of almost one billion people living in rural areas depend on climate prone sectors like agriculture, fisheries, livestock and forests. India ranked fifth in the Global Climate Risk Index 2019. Earlier seasonal snowmelt, depleting glaciers and uncertainties in monsoon patterns threaten agriculture output and fresh water supplies. Rapid urbanisation, rising temperatures, changes in precipitation, extreme rainfall events, altered coastlines, depleting water tables and destroyed biodiversity hotspots affect migration, conflicts and spread of diseases. Around 44% of India is under various degrees of drought conditions. The worst affected are the poor, marginalized, indigenous, women and the future generations (<https://www.dailypioneer.com/2021>).

At present the world is facing dual challenges of Covid-19 and climate change. India has been hailed as a global leader by many global leaders for its efforts to tackle the climate change and Covid-19. Many leaders including Donald Trump acknowledged the role of India as an emerging superpower in the fight against climate change (<https://www.epw.in/engage/article/india-global-leader>). Though much of climate change crisis in India is a result of the extremes of developed world, but there are certain domestic factors like thermal power and agricultural policies. Thermal power is responsible for approximately 68% of total GHG emissions while an incompetent agricultural policy further worsen crop yield and climate change (Raptis, C. E et al, 2020). Almost 90% of groundwater goes off into irrigation and about 80% of it goes to rice and wheat. According to a report of Japan research institution, the poverty mitigation initiatives would result in a 50 percent increase in the emissions of GHGs. However, by providing proper food, energy, and transportation policies, this increase can be restricted (<https://www.dailypioneer.com/2021>).

Climate finance as drawn by the Paris agreement is used by poor countries to reduce their greenhouse gas emissions by investing in clean energy generation, and to adapt to the impacts of extreme weather such as floods and droughts (Banga, J. 2019). A fast growing and shifting nation like India should focus on reducing green house gas (GHG) emissions by introducing key sectors on a low carbon growth pathway, with strong climate associations and laws. India needs



investments to add more renewable energy capacity, build sustainable agricultural value chains to ensure food security, and create climate-resilient cities to act on climate change. Existing financing and innovation structures for climate action enterprises are insufficient.

The rich nations committed in Cancun Agreements (2010) to mobilize jointly USD 100 billion per year by 2020 through the to address the needs of developing countries (Khan, M et al. 2020). The Green Climate Fund (GCF) was founded in Cancun Agreement and chosen it as an operating body of the financial mechanism. The rich nations confirmed this goal in the Paris Agreement (2015) and agreed to set USD 100 billion per year prior to 2025. Nevertheless, the rich countries are falling behind on their pledges to help the poor world tackle the climate crisis. India has potential to lift its renewable energy (RE) competence from the early goal of 175 GW to 500 GW by 2030 (Majid, M. A. 2020). It is believed that switching to RE would diminish reliance on traditional coal and gas supplies while at the same time reduce GHG emissions and generate more employment. Additional returns like enhanced air quality, water use, land use and biodiversity; improved social sustainability related to livelihoods, income distribution, migration and housing has incentivized political support. During the covid-19 pandemic, India's percentage of Renewable Energy (RE) go up from 17% to 24% while coal-fired power turned down from 76% to 66% (<https://www.dailypioneer.com/2021/sunday-edition/climate-change->). This has been an amazing jump for India that driven for 'Common but Differentiated Responsibilities and Respective Capabilities' based on historic emissions in 1990s and championed the idea that rich nations (global north) must reduce their emissions and create an institutional mechanism for climate action funding for global south (rich countries) to expand their mitigation capacities (without binding commitments) while not hindering their economic growth.

Ahead of the United Nations Conference of Parties (COP24), the BASIC (Brazil, South Africa, China and India) countries said that they would drive developed countries on their commitment to providing \$100 billion annually from 2020. However, countries till now haven't even decided on what comprises climate finance. In accordance with the principle of "common but differentiated responsibility and respective capabilities" "the rich countries have pledged to provide financial support of \$100 billion annually to poor countries. The funding mobilized would help poor and susceptible communities cope with the already existing effects of climate change and adjust their livelihoods. On the other, mitigation initiatives would minimize the damages brought about by the climate crisis in developing countries (Ravindranath, N. H., & Sathaye, J. A. 2002). Thus, climate finance play a decisive role to tackle the effects posed by climate change and achieve the goal of IPCC 2018 to limit the rise in earth's average temperature to below 2 degree Celsius over pre-industrial levels (Tollefson, J. 2018).

### **Research Objective**

With this context, we discuss about the climate finance based on secondary research and preliminary discussions with other researchers and practitioners. Here, we provide a brief history of climate finance and identify prominent issues of different sources of climate funds in India and at global level.

### **Materials and Methodology**

The present synthesis is based on the secondary data obtained from various repositories like Pub Med, EMBASE, SCOPUS, and the Google scholar databases from January 2007 to



January 2021. The search was performed by typing various variables like IPCC, global warming, economics of climate change, climate finance and green technology. Though a number of searches were made, we included only few suitable studies. All included research publications were systematically evaluated and conclusions were drawn accordingly. Information was also obtained from press releases and other web sites and articles addressing environmental issues. Meetings with experts and researchers have also been a useful source of information and have provided opportunities for exchanging views.

### **Commitment of Advanced Economies**

Through the Cancun Agreements in 2010, the developed countries committed to mobilize jointly 100 billion USD per year by 2020 to tackle the needs of poor countries (Smith, J. B et al. 2011). The Green Climate Fund (GCF) was established in the Cancun Agreement and in 2011 it was nominated as an operating unit of the financial mechanism and is headquartered in the Republic of Korea. Under the Paris Agreement in 2015, developed countries confirmed this goal and agreed that prior to 2025, a new collective quantified goal from a floor of USD 100 billion per year shall be set. The Paris Agreement reaffirms the obligations of developed countries, while for the first time also encourages voluntary contributions by other Parties.

### **Need for Climate Finance**

Since climate change actions have started, the finance approach has been discussed with due consideration. The 1992 Rio earth summit can be called the pioneer in the climate finance regime as it started the institutional mechanism through Global environmental facility. The World Economic Forum (2020) estimated that about \$5.7 trillion will require annually in green infrastructure by 2020 to combat the climate change (Barua, S. 2020). The existing commitment of \$100 billion annually is only a small piece of the \$5.7 trillion mystery. For that reason, financial support is needed to meet the investment needs in 2020 and beyond for mitigation and adaptation. It is also imperative to support developing countries to build flexibility to worsening climate impacts and to catalyzing private sector climate investment. Climate Finance is needed to change the world's economy to a low-carbon path, as direct government financial support is inadequate in these countries. Following global funding bodies were established to limit the green house gas (GHG) emissions in developing countries which aimed to help vulnerable societies adapt to the inevitable impacts of climate change.

### **Adaptation Fund (AF)**

It was established under the Kyoto Protocol in 2001 and has committed US\$ 532 million to climate adaptation and resilience activities.

### **Global Environment Fund (GEF):**

GEF has served as an operating entity of the financial mechanism since the Convention came into force in 1994. It is a private equity fund focused on seeking long term financial returns by investments in clean energy under climate change.

The Special Climate Change Fund (SCCF) and the Least Developed Countries Fund (LDCF). In addition to providing guidance to the GEF and the GCF, parties have established two special funds. Both funds are managed by the GEF.



### India and climate change

The IPCC (2014) Fifth Assessment Report predicted that climate change will have widespread impacts on Indian society and its interaction with the natural environment (Das, S et al. 2020). It has projected that climate change will slow India's economic growth, impact health and development, make poverty reduction more difficult and erode food security. To combat the impacts of climate change and to achieve the low-carbon transition the country requires USD 3.8 trillion annually between 2016 and 2050, for mitigation investments alone (IPCC 2018). Further, the estimations of adaptation costs are up to USD 180 billion annually between 2020 and 2030 (Szilagyi, L. 2020).

### Climate financing in India

India has promised to spend USD 100 billion in clean energy over five years. The Smart Cities and Smart Mobility plans together with policies like Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME-II) would ensure that India embarks on a sustainable transport growth. India pledged to reduce its emissions intensity by 33-35% over 2005 levels at Paris COP21 (Shukla, P. R et al. 2017). To achieve these targets it requires producing as a minimum 40% of its energy from renewable and sequestering additional 2.5 to 3 billion tonnes of CO<sub>2</sub>eq through afforestation by 2030. The Climate Action Tracker hailed the compatible actions and efforts of India to combat emissions to limit the global warming to 2°C. Although India is loyal to its commitments till 2030, it requires long term goals for sustainable, equitable and carbon free growth to follow a 1.5°C path. Through the flow of technology, policy, financial and social actions these pledges can be achieved and it would help to gain political support for better mitigation and setting net-zero targets. The Finance Minister of India urged the advanced economies to scale up their commitments to climate finance and transfer of technologies which are important for achieving climate-related commitments and goals.

### Sources of funding

Climate financial support can come from a variety of sources. The government of India has established a Climate Change Finance Unit (CCFU) in the Ministry of Finance, which is the nodal agency for all climate change financing matters. The largest source of climate financing in India is public funding, which is routed through budgetary allocation and several funds and schemes related to climate change established by the Government of India such as National Clean Energy Fund (NCEF) and National Adaptation Fund (NAF). However, public funding in India is inadequate and misused. For example, NCEF funds have been used to meet budgetary shortfalls in the Ministry of New and Renewable Energy (MoNRE) (<https://dea.gov.in/divisionbranch/climate-change-finance-unit>).

The Government of India also provides funding through eight missions established under the National Action Plan for Climate Change. Furthermore, there is no evaluation of climate relevance of publicly funded projects in India, making it difficult to assess financial allocation towards climate action.

### The scale of needed investment in India

Under Paris Accord, India has committed to reduce its carbon emission intensity emission per unit of GDP by 33-35%. To achieve these targets and build its renewable capacity India



requires huge climate finance. At present, the country's Green Bond market is in initial stage which indicates the need to explore more options for climate financing. In India, banks and non-banking financial companies have a low desire for long-term liability due to mismatch of asset-liability. Along with problems arising out of climate change, India also face traditional problems like poverty, pollution, education and skill gaps etc. Hence there is a greater need for climate finance. Climate Change actions and Finance mechanisms in India

The Government of India approximately spends 2.6% of GDP on climate adaptation but still falls short by USD 38 billion (<https://dea.gov.in/>). India has always said that it follows the "vasudhaiv kutumbakam" (the world is one family) mantra and is fully committed towards the climate change action. India's intended Nationally Determined Contributions (INDCs) under UNFCCC to reduce the GHG emissions intensity of its GDP by 33 to 35 percent by 2030 from 2005 level. To achieve about 40 percent electric power installed capacity coming from non-fossil fuel-based energy resources by 2030. To achieve this, it has been continuously building on to its climate finance mechanisms

The establishment of the Climate change finance unit in 2011 in the Finance Ministry gave shape to the climate finance mechanism. The NITI Aayog is primarily responsible for the estimation of finance requirements in the country.

### **Climate finance in India comes through the following agencies-**

- Union Budgetary support
- State Budgetary support
- The National Adaptation Fund
- The National Clean Energy Fund.
- The compensatory Afforestation Fund
- Mitigation part of the National Disaster Response Fund.

The National Action Plan on Climate Change is a comprehensive response of India to the menace of Climate change.

The National Mission for Enhanced Energy Efficiency under the NAPCC gives practical financial mechanisms through its programmes like-

- PAT- Perform, Achieve and Trade.
- MTEE- Market Transformation for Energy Efficiency.
- EEFP- Energy Efficiency Financing Platform.
- FEEED- Framework for Energy Efficient Economic Development.

External Support by Global Environment Facility, Adaptation fund, Global Climate fund etc.

### **Challenges**

Climate finance is critical to tackling the issues posed by climate change. It is uncertainly difficult to measure climate finance accurately. The UNFCCC report points to the lack of systematic data collection on private finance flows, confidentiality restrictions and accounting issue. The technical group of people is efficiently functioning to find out validate solutions and in the meantime the corporate community is looking at alternative funding models. There are several issues in accessing multilateral funds like GEF and GCF that are primarily funded by developed countries that have had a higher share of emissions, historically.



The MoF discussion paper highlights that developed countries in 2009 pledged to contribute US\$ 100 billion per year by 2020 to climate funds. However, in 2016 the total climate finance contribution was just US\$ 38 billion, less than 40% of the US\$ 100 billion pledge.

Moreover, the total pledges to GCF was only US\$ 10.3 billion till July 2019, which is highly inadequate considering the estimated cost for developing countries to implement their NDCs is US\$ 4 trillion.

Now, the USA under the Trump administration has also withdrawn from the Paris agreement, which is going to impact the flow of funds for climate finance significantly.

Multilateral funds are also criticized for a poor accounting framework. Lack of conformity on the definition of climate finance, lack of transparency, inflation of reported figures of contribution by developed countries and for being heavily skewed towards mitigation funding as compared to adaptation funding.

Most of the GCF funding has been used for climate mitigation projects in the renewable energy sector. At the same time, there is limited focus on climate adaptation projects.

**Lack of acceptable definition:** Various organizations define climate finance in different ways making it difficult to synergize the operations.

**Multiple sources:** Climate finance comes in many sources, which means that measuring it is a massive and difficult task.

**Lack of standard accounting framework:** It leads to double-counting, exaggerated numbers, repackaging the existing support to look like new aids etc.

**No scientific analysis;** Many feel that the \$100 bn commitment in the UNFCCC figure is not enough and the number was not a product of sufficient analysis.

Almost 75% of the climate finances raised by the rich nations are used domestically, despite developing countries bearing a significant burden of the emissions and loss of natural ecosystems as a result of the industrialisation-drive in the developed world.

The whole pledges to GCF was only USD 10.3 billion till July 2019, which is extremely scarce considering the estimated cost for developing countries to implement their Nationally Determined Contributions (NDCs) is USD 4 trillion.

### **Most climate funds have flown into mitigation, rather than adaptation.**

Climate finance has typically focussed on renewable energy, green buildings and urban transport, because it is easier to estimate their cash-flow cycles. Other sectors which hold implications of equal magnitude to our natural and social ecosystems, like agriculture, degradation of land, water, etc. have seen an unresponsive interest.

**Flow of money:** The money flow for climate finance is irregular. It is heavily biased towards mitigation and the adaptation activities are lagging behind. The worst effect of this situation would be on the least developed countries.

**The attitude of the well-off:** The US decision not to pay the remaining \$2bn of their contribution is alarming. Developed countries had met only up to a quarter of their commitment. **Viability of Climate funding:** The climate change projects have a long gestation period. The threatening slowdown does not help either as most countries and corporations are going for cost-cutting which almost always affects badly on climate finance.

**Suggestions**



A predictable, assured and transparent climate finance management is a necessary condition for it to materialize in a sufficient amount. Climate finance must fall under accountability institutions like CAG at the global level too. Public institutions, in particular, must make every penny count and ensure quality as well as quantity. Governments should continue to raise the level of ambition in national climate plans and target resources. Favourable policy and institutional support are necessary for climate finance. The world leaders must work to negate protectionism and work with each other. The private sector must be further engaged to make contributions. Public and private actors must cooperate to enhance finance in sectors beyond renewable energy generation towards adaptation.

### **Conclusions**

Recent reports show that the world is not yet on track to limit global temperature increase to 1.5 degrees and avoid the worst impacts of the climate crisis. The Paris Agreement stipulates that developed countries must provide climate finance and seek a balance between support for mitigation and adaptation.

Richer countries promised \$100bn by 2020 and yet they have simply decided not to meet this obligation. It has been under these expectations that poorer nations have continued to collaborate in good faith, working to plot a development path without fossil fuels. Climate finance is provided by developed nations to poor nations to reduce GHG emissions as a key source of funding for adaptation and mitigation efforts. Rich countries' latest climate finance commitments still fall short of the \$100 billion target they committed to in 2009 and contain a sorrowful lack of detail, predictability or clarity regarding delivery and timeline for future funds. It is critical to addressing climate change because large-scale investments are required to significantly to reduce emissions. In the same way, it is also important for adaptation, for which significant financial resources will be similarly required to allow countries to adapt to the adverse effects and reduce the impacts of climate change. Climate financing needs to be reported in a way that better reflects its real value to developing countries and the real effort made by developed countries. In this analysis, we have given a brief overview of climate finance in India and discussed significant concerns and challenges. We believe that policy and industry actions must come together to take climate finance ahead in India. Multilateral funds are a major source of climate finance; however, they suffer from fundamental problems of insufficient contributions from developed countries, weak accounting frameworks and disagreement on the definition of climate finance. Public funds, while being the largest source of climate finance in India, are marked by insufficient funds which are misused with no accounting framework. Private funds can play an important role – but their emphasis on low risk and high return, may not be suitable for large scale funding.

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