Climate Adaptation Finance - Experiences and Lessons from Multilateral Framework .

A dissertation submitted to Panjab University, Chandigarh for the award of Master of Philosophy in Social Sciences in partial fulfillment of the requirement for the Advanced Professional Programme in Public Administration

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Under the guidance of

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46th Advanced Professional Programme in Public Administration

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CERTIFICATE

I have the pleasure to certify that Ms. Rajasree Ray has pursued her research work and prepared the present dissertation titled ***Climate Adaptation Finance - Experiences and Lessons from Multilateral Framework*** under my guidance and supervision. The dissertation is a result of her own work and to the best of my knowledge, no part of it has earlier comprised any other monograph, dissertation or book. This is being submitted to Panjab University, Chandigarh for the degree of Masters of Philosophy in Social Sciences in partial fulfillment of the requirement for the Advanced Professional Programme in Public Administration (APPPA) of the Indian Institute of Public Administration (IIPA), New Delhi.

I recommend that the dissertation of Ms. Rajasree Ray is worthy of consideration for the award of M.Phil degree of Panjab University.

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SELF DECLARATION

I declare that the dissertation titled ***Climate Adaptation Finance - Experiences and Lessons from Multilateral Framework*** for the award of the degree of Master of Philosophy in Social Sciences in partial fulfillment of the requirement for the Advanced Professional Programme in Public Administration (APPPA) of the Indian Institute of Public Administration (IIPA), New Delhi is original research work and that as per the best of my knowledge the work or part thereof has not been submitted earlier for the award of Master of Philosophy of either IIPA or any other University.

Date: 9 March 2021

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The choice of the topic for my research came naturally to me, having spent a long time handling the climate change issues in official capacity. My objective was to examine the issues from a rigorous academic lens. Though it seemed simple initially, the process was indeed challenging and required me to examine issues from an academic perspective and leave my official baggage. The APPPA programme provided me with the opportunity to pursue my objective of applying years of my official experience into a detailed academic work.

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(Rajasree Ray)

LIST OF ABBREVIATIONS

AFOLU	Agriculture, Forestry and Other Land Use
AR5	Fifth Assessment Report
BTR	Biennial Transparency Report
BPL	Below the Poverty Line
CCAP	Climate Change Action Programme
CDM	Clean Development Mechanism
CDRI	Coalition for Disaster Resilient Infrastructure
CEIT	Countries with Economies in Transition
CER	Certified Emission Reduction
CO_2	Carbon dioxide
COP	Conference of Parties
CSS	Centrally Sponsored Schemes
CTU	Clarity, transparency and understanding
EMDEs	Emerging Market and Developing Economies
GCF	Green Climate Fund
GEF	Global Environment Facility
GHGs	Greenhouse gases
GRB	Gender Responsive Budgeting
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
LDCF	Least Developed Countries Fund
LPG	Liquefied Petroleum Gas
MDBs	Multilateral Development Banks
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act

MOU	Memorandum of Understanding
MPGs	Modalities, Procedures and Guidelines
MRV	Measurable, Reportable and Verifiable
NAPCC	National Action Plan on Climate Change
NDCs	Nationally Determined Contributions
OECD, DAC	Organization for Economic Co-operation and Development- Development Assistance Committee
PAWP	Paris Agreement Work Programme
PMUY	Pradhan Mantri Ujjwala Yojana
PPGs	Project Preparation Grants
SAPCC	State Action Plans on Climate Change
SCCF	Special Climate Change Fund
SCF	Standing Committee on Finance
SDGs	Sustainable Development Goals
SGPs	Small Grants Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WMO	World Meteorological Organization

EXECUTIVE SUMMARY

Man-made activities in the last more than 150 years have added significant quantities to the stock of greenhouse gas (GHG) emissions in the atmosphere. The current stock of GHGs is the result of the pathways of economic growth followed by the industrialized countries. Intergovernmental Panel on Climate Change (IPCC) pointed out that if goes unmitigated, the impacts of climate change can be serious across various economic sectors. IPCC first assessment report (1990) played a crucial role in establishing United Nations Framework Convention on Climate Change (UNFCCC) in 1992, the international treaty to reduce global warming and cope with its consequences. Keeping in view the historical contributions of industrialized countries, the UNFCCC called them to take a leading role and provide financial support to developing countries. Even today, 60 percent contribution to the stock of GHG emissions are from developed countries.

2. Responses to climate change involve mitigation and adaptation strategies. Efforts to reduce emissions and enhance sinks are referred to as “mitigation” and “adaptation” involves reducing the vulnerability to the harmful effects. The adverse impacts falls disproportionately on developing countries who contributed little to the stock of GHGs. Yet, the new asks and demands on developing countries for reducing GHG emissions have intensified citing the science of climate change. On one side, no country in the world has been able to achieve a Human Development Index of 0.9 or more without an annual energy supply of at least 4 tones of oil equivalent per capita. On the other hand, adaptation received less attention in the early years of UNFCCC due to the difficulties in defining adaptation, distinguishing it from effective

development and the absence of an article devoted to adaptation restricting the formal space. Nevertheless, it was an important constituent in the Convention.

3. Attention to adaptation has grown since the release of IPCC Third Assessment Report (2001). Subsequently, Bali Action Plan (2007) and the Paris Agreement (2015) includes adaptation and finance as equal pillars. Adaptation is an urgent policy priority now and adaptation finance. Adaptation finance, which are investments in activities that address current and expected effects of climate change has emerged as a major challenge. Both the Convention and the Paris Agreement explicitly recognizes the development imperatives of developing countries. Given their vulnerabilities, the adaptation finance requirements has to be viewed from the poverty alleviation and basic needs lens.

4. It is recognized that measuring and reporting of finance to address adaptation is essential. Yet, climate finance lack a system of accounting modalities, due to which actual size of adaptation finance flows are not known. There are differing views, claims and counter claims. The way forward is actually capturing the data at a granular level in a transparent way through an agreed template, to bring the credibility and accuracy of the numbers reported and addresses the principles of adequacy and predictability. However, the outcomes from the process are sub optimal. In this context, the aim of this study is to explore and identify the components of adaptation finance so that transparent accounting, and capturing the actual size of adaptation finance flows in contrast to the requirements can be done.

5. The study focused on the complexities around the operational definition of adaptation finance. As mandated by the multilateral treaty, it is imperative on countries to take climate actions including adaptation on the basis of the principle of

'equity' and common but differentiated responsibilities. It is imperative on industrialized countries to provide financial resources to the developing countries. Hence, the priority should be to work towards an operational definition as to what constitutes adaptation and a common accounting methodology. Further, it is necessary to distinguish between a development project and a climate project for measuring, reporting and verifying adaptation finance.

6. Compliance mechanism agreed in the Paris Agreement Work Programme (PAWP) should be considered as an opportunity to discipline the reporting requirements of climate finance. It is binding on the countries to report accurately and correctly in a transparent manner. The study has figured out the important elements of climate finance, various levels of capturing climate finance at a granular level, modalities for accounting, key steps for comprehensive reporting system and suggested a template for comprehensive accounting. Including these provisions through a UNFCCC process can bring the transparency and thereby clearly understand the size of adaptation finance.

7. With the emerging knowledge of climatic change and its impacts, greater attention to adaptation has been accorded in India's policy framework. The launch of National Action Plan on Climate Change in 2008 and the preparation of Nationally Determined Contribution (NDC) in 2015 are important milestones. The future road map has to spell out and assess how adaptation figures in national-level plans. One step is to consider climate markers in the budget documents to identify and monitor climate finance across different sectors. As a striving developing economy, the developmental needs will increase. Substantial efforts are required to ensure access to basic economic and social services. Union Budget 2020-21 stated that NDC

implementation would be a part of budgetary process. However, climate change impacts are expected to worsen, which implies that India has to go beyond its budgetary resources. A transition to a climate resilient economy requires new, additional and climate-specific financial resources including international finance, for which a robust climate finance architecture and an ambitious new collective goal on climate finance must be set. Post pandemic, more than ever, the climate commitments must reflect equity and the principle of common but differentiated responsibilities and respective capabilities. India can sharpen its NDC as its economy progresses. If the lead role by developed countries is not adhered, then climate finance remains as a major challenge for developing countries and the proposed NDCs may not fructify. Inclusive sustainable macro-economic development would require that the adaptation objectives are adequately responded.

8. Various estimates for climate actions makes a case for trillions of dollars. The inadequacy of resources in the global climate finance architecture including the Green Climate Fund has been a concern. The absence of a definition further complicated the transparency issues. The actual flows remained much lesser than what has been claimed and much lesser than Copenhagen goal of USD 100 billion annually.One step to address this issue is to have a Synthesis Report on Copenhagen goal compiled by the UNFCCC. It would be a valuable input for future climate process. One major task before the Parties for future climate negotiations is to discuss and agree on transparency of support provided and to achieve the scope, scale and speed of climate finance required.

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CHAPTER 1: INTRODUCTION, OBJECTIVES, METHODOLOGY AND LIMITATIONS

INTRODUCTION

1.1 The issue of climate change[1] has emerged as one of the most compelling global challenges of our times. In this context, there are calls from various quarters to not only ramp up climate actions worldwide but also taking climate actions urgently. Climate actions spans into the spheres of science, policy, technology and finance.

1.2 It is now a well-established scientific fact that the concentration of greenhouse gases[2] (GHGs) in the earth's atmosphere is directly linked to the average global temperature on Earth. Climate change is primarily caused by the building up of GHGs in the atmosphere. The atmosphere carries out the critical function of maintaining life-sustaining conditions on Earth. *The sun radiates solar energy on earth and a large part of this energy, about one third is radiated back into space and the balance being absorbed by the surface and atmosphere. GHGs re-emit some of this heat to the earth's surface. If they did not perform this useful function, most of the heat energy would escape, leaving the earth cold and unable to support life. In this manner the atmosphere supports a natural greenhouse effect which helps sustain life on earth* (Economic Survey, 2011-12). However, ever since the Industrial Revolution began about more than 150 years ago, man-made activities have added

[1]United Nations Framework Convention on Climate Change defines climate change as a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.

[2] "Greenhouse gases" means those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorbs and re-emits infrared radiation (UNFCCC).

significant quantities of GHGs to the atmosphere. It is the stock of historical GHG emissions that contribute to the concentration of GHGs in the atmosphere.

Reports of the Intergovernmental Panel on Climate Change (IPCC)

1.3 In 1988, the IPCC was established by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO). In 1988, United Nations endorsed the creation of the IPCC. In its resolution, the United Nations stated *"certain human activities could change global climate patterns, threatening present and future generations with potentially severe economic and social consequences; and continued growth in atmospheric concentrations of greenhouse gases could produce global warming with an eventual rise in sea levels, the effects of which could be disastrous for mankind if timely steps are not taken at all levels."* The major task of the IPCC is to prepare a comprehensive review of the state of knowledge of the science of climate change; the social and economic impacts of climate change, and make recommendations on the potential response strategies. The IPCC has so far published five assessment reports and a number of special reports on climate change. The first Assessment Report of the IPCC (1990) stated that it is certain that there is a natural greenhouse effect which already keeps the Earth warmer than it would otherwise be and emissions resulting from human activities are substantially increasing the atmospheric concentrations of GHGs. The Report stated with confidence that carbon dioxide (CO_2) has been responsible for over half the enhanced greenhouse effect in the past, and is likely to remain so in the future. Even if all human-made emissions of CO_2 were halted in the year 1990, about half of the increase in CO_2 concentration caused by human activities would still be evident by the year 2100.

1.4 In its Fifth Assessment Report (AR5, 2014), IPCC categorically concluded that climate change is real and the main cause for this is human activities. Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and oceans have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of GHGs have increased. Each of the last three decades has been successively warmer than any preceding decade since 1850. AR5 explained that from 1880 to 2012, the average global temperature increased by 0.85°C. Given current concentrations and ongoing emissions of GHGs, it is likely that by the end of this century global mean temperature will continue to rise above the pre-industrial level. Limiting climate change will require substantial and sustained reductions of GHG emissions. The IPCC Special Report (October 2018) informed that it is still possible to limit climate change to 1.5°C if—and only if—there are rapid, far-reaching and unprecedented changes in all aspects of society.

Impacts of Climate Change

1.5 From the above narration, it is clear that the science of climate change has been pointing towards various adverse effects of climate change[3]. The leading features of climate change are: rise in average global temperature, ice cap melting, changes in precipitation, and increase in ocean temperature. If goes unmitigated, it can result in shifting weather patterns, adverse impacts on food production, rising sea levels, etc. The impacts of climate change can be serious across various economic sectors and is often met with market failures as climate change is a global externality

[3] "Adverse effects of climate change" means changes in the physical environment or biota resulting from climate change which have significant deleterious effects on the composition, resilience or productivity of natural and managed ecosystems or on the operation of socio-economic systems or on human health and welfare.

associated with the emission of GHGs, which has long, persistent and, beyond a level, irreversible effects.

Global Warming Potential and Stock of GHGs in the Atmosphere

1.6 The global warming potential of all GHGs is not equivalent because of the long-term effects on climate change. The main factor here is whether it is short lived or long lived. In other words, the question is whether it is a stock or a flow gas. CO_2 is the predominant stock gas in the atmosphere. Now the question is who contributed to the stock of GHGs in the atmosphere? The current stock of GHGs is a result of the economic growth and development in the industrialized countries in the past which demanded increasing amounts of energy as economic growth has a strong influence on energy consumption. Energy makes up nearly three-quarters of global emissions. In other words, industrialized countries emitted GHGs primarily to generate energy and through the production and consumption of that energy became today's prosperous countries with capital stock, infrastructure, resilience etc. In contrast, the adverse impacts of climate change falls disproportionately on developing countries who contributed little to the stock of GHGs. To put it differently, although adverse impacts of climate change is likely to be felt over the entire Planet, developing countries are likely to be more vulnerable as they have a large population dependent on land and farming which are likely to bear the brunt of climate change. Yet, the new asks and demands on developing countries for reducing GHG emissions have intensified citing the science of climate change. It must be realized that no country in the world has been able to achieve a Human Development Index[4] of 0.9 or more

[4]The Human Development Index (HDI) is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and have a decent standard of living. The HDI is the geometric mean of normalized indices for each of the three dimensions (UNDP).

without an annual energy supply of at least 4 toe[5] per capita. Even today, 60 percent contribution to the stock of GHG emissions are from developed countries.

Global Response to Climate Change

1.7 As climate change is a global environmental issue and all countries will be affected by it, countries together need to have a coordinated response, for which there was a need to have a global system. In short, effective responses would require a globally coordinated effort. International community determined to protect the climate system for present and future generations and accordingly an international climate treaty was adopted at the Rio Earth Summit in 1992. The multilateral climate change regime is governed by the United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC (The Convention) laid the groundwork for concerted international action. The Convention aims at *stabilization of GHG concentration in the earth's atmosphere at a level that would prevent dangerous atmospheric interference with the climate system. The UNFCCC mandates that Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities*. The Convention entered into force on March 21, 1994. The Convention enjoys near universal membership. India ratified the Convention on November 1993. The preambular para of the Convention noted that *"the largest share of historical and current global emissions of greenhouse gases has originated in developed countries, that per capita emissions in developing countries are still relatively low and that the share of global emissions originating in developing countries will grow to meet their*

[5]Tonne of oil equivalent - Unit of measurement of energy consumption (OECD)

social and development needs". Keeping in view the historical contributions of industrialized countries, the Convention called them to take a leading role in addressing climate change and the adverse effects thereof.

1.8 UNFCCC in its Article 3, para 3 states that "*policies and measures should take into account different socio-economic contexts, be comprehensive, cover all relevant sources, sinks and reservoirs of greenhouse gases and adaptation, and comprise all economic sectors"*. In its Article 4, para 4, it further states that *"the developed country Parties and other developed Parties included in Annex II*[6] *shall also assist the developing country Parties that are particularly vulnerable to th*e adverse effects of climate change in meeting costs of adaptation to those adverse effects". In short, industrialized nations agreed under the Convention to support climate change activities in developing countries by providing financial support. The UNFCCC review the implementation of the Convention at the annual meetings of the Conference of Parties (COP).

1.9 The UNFCCC states two fundamental response strategies: mitigation and adaptation. *While mitigation seeks to limit climate change by reducing the emissions of GHGs and by enhancing 'sink' opportunities, adaptation aims to alleviate the adverse impacts through a wide range of system-specific actions* (Fussel and Klein, 2002). Though the Convention acknowledged the vulnerability of countries to the effects of climate change, particularly, developing countries due to their limited resources, adaptation as a response strategy received less attention compared to mitigation. The term "adapt" and "adaptation" have been mentioned only 6 times in

[6]Those developed countries that are required to provide financial resources to enable developing countries to undertake emissions reduction activities under the Convention and to help them adapt to adverse effects of climate change.

the text of the Convention. The Convention does not define adaptation and no article has been exclusively devoted to adaptation. This probably meant a limitation of formal space in the initial years of multilateral discourse on adaptation. Nevertheless, it was an important constituent in the text of Convention, including in its Article 2 on ultimate objective and various key articles. In essence, more attention has been devoted to mitigation in the past. *One reason for this could be that climate change emerged as a problem to the long-term disturbance of the global geo-biochemical cycles and associated effects on the climate system* (Cohen et al 1998). Adaptation has tended to lag behind mitigation, in part this is because *adaptation and development specialists, governments, NGOs, and international agencies have found it difficult to clearly define and identify precisely what constitutes adaptation, how to track its implementation and effectiveness, and how to distinguish it from effective development* (Burton et al., 2002; Arnell, 2009; Doria et al., 2009). A contributing reason is that adaptation has no common reference metrics in the same way that tonnes of GHGs or radiative forcing values are for mitigation methods. Estimating adaptation finance, in particular, are difficult due to the fact that it is context-specific and incremental. In 1997, Parties to the UNFCCC adopted the Kyoto Protocol in recognition of necessity for strengthening developed countries' commitment in furtherance to the objectives of the Convention and largely concerned with quantitative limits for GHG emissions. Kyoto Protocol also placed responsibilities on developed countries to provide finance and technology to developing countries to assist them in undertaking climate-related responsibilities.

1.10 Sensitivity to the issue of adaptation has grown since the release of the Third Assessment Report of IPCC in 2001. Adaptation gained traction gradually. *Adaptation has now emerged as an urgent policy priority, prompting action both*

within and outside the climate change negotiations (Parry et al.2005). The reasons are very clear. First, even if the initiatives are taken to mitigate the GHGs being emitted into the atmosphere, the earth is likely to experience a certain degree of change in the climate. These changes are likely to impact all natural and human systems though the nature of impacts and their severity shall vary from region to region. Large-scale changes in the climate system are a matter of grave concern for vulnerable developing countries. Second, due to the adverse impacts of climate change on various sectors of the economy, climate change puts additional stress on socio-economic systems specifically in developing countries, which are already under stress. Third, both mitigation and adaptation strategies need to be considered in an integrated way. Climate adaptation has a key role to play, in particular, for developing countries in determining how climate impacts manifest on the ground and how much damage they cause. Fourth, an analysis of sector specific vulnerabilities, therefore, is imperative to comprehend the current and future risks to climate in order to initiate necessary and timely action in response to these risks. Of course, funding of adaptation activities has emerged as a major challenge.

Adaptation as a Response Strategy and its Financing

1.11 It is in this context, the present study intends to explore and analyze the adaptation response strategies and its financing since 1992. IPCC (2001) defines 'adaptation' as *an adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished, including anticipatory and reactive adaptation, private and public adaptation, and autonomous and planned adaptation*.

1.12 Addressing the challenge of climate change in terms of response strategies means corresponding additional resources, in particular, the finances required to effectively address it. This clearly brings to the forefront the economics of climate change into the serious discourse. As such, it is also a complex economic policy issue both at the international level and for domestic governments. Added to it, climate change is a global public good, implying that there would be market failures and its economic dynamics giving rise to complex socio-economic policy issues. Policy intervention is also expected to factor in the concept of inter generational equity as GHG emissions impose a cost on both the present and the future generations, which are not fully recouped from the emitters of these emissions.

1.13 Aggregate estimates of financial needs for adaptation have been published by various organizations including by the UNFCCC. While these estimates vary depending on the assumptions and methodologies used in the estimation, what is certain and common in these estimates is the enormous magnitude of the finance requirements to take climate adaptation actions. The fact remained that a yawning gap continued to exist in the funds required by most developing countries for implementation of appropriate adaptation projects and the funds available to them.

1.14 The UNFCCC has attempted to respond to adaptation financing needs by setting up key Funds for adaptation actions. However, a major challenge has been to separate out the additional costs of climate change adaptation from normal development activities. At the 15th COP in Copenhagen in 2009, climate finance was quantified for scaling up climate actions by developing countries and a flow of USD 100 billion a year by 2020 by the developed countries was mooted. Further, it was decided to set up a dedicated Green Climate Fund (GCF) to provide support to

developing countries by assisting them in mitigating climate change and adapting to its impacts. The COP-17 at Durban in 2011 decided to launch a process to develop a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties. The process was concluded at COP-21 in Paris in December 2015 in which a new Agreement in the shape of a treaty was adopted under UNFCCC to enhance the implementation of the Convention, including its objective. The adoption of Paris Agreement marked a milestone in the global collective action in the field of containing climate change and its adverse effects. This universal agreement aimed at actions from 2020 onwards sets the world towards a low-carbon, resilient and sustainable future. The Agreement is not mitigation-centric and includes adaptation, finance, technology and capacity building as equal pillars. The important role of finance as an enabling factor in ensuring collective efforts at addressing the global problem of climate change was reiterated in Article 9 of the Paris Agreement. With the continuously emerging knowledge of climatic change and its impacts, greater policy attention to adaptation has been accorded in the Indian climate policy framework also.

1.15 Adaptation actions will have to be specific to national and local circumstances depending on the vulnerability of the different sectors of the economy and its implications. *The reason for this is that adaptation is of local importance: it has to be driven by the local needs and implemented locally* (Mauskar, 2014). For India, adaptation is inevitable and an imperative for the development process. A Government of India Report (June, 2020) observes that "c*limate change impacts are expected to worsen with the passage of time because of the momentum due to present*

carbon stock continuing to raise the temperature. Hence, India's adaptation needs will have to be intensified and so the adaptation costs will increase."

1.16 The demand for adaptation agenda discussion by the developing countries was often accompanied with demand for adaptation finance. This helped in bringing the focus and attention to financing adaptation and the operationalizing the institutions and bodies created for financing adaptation. In the run- up to Paris Agreement negotiations, the developing countries as a group were very clear about the focus to be given to adaptation in the new global pact. Developing countries strongly argued and successfully brought the parity in the treatment between mitigation and adaptation (Decision 1/CP.21[7]). However, the gap between promises and actual flows of finance and the transparency of the numbers reported remained as a concern as climate finance continued to be a matter of contentious debate. Even at the time of adoption of the historic Paris Agreement in 2015, the wide gap between the promised annual climate finance flows of USD 100 billion at Copenhagen in 2009 and the actual climate finance received by developing countries was revealed through various analytical papers. An analysis of the post Paris Agreement developments suggests that much more work needs to be done to meet the targets which are contingent on the momentum in international climate finance arena and the scope, scale and speed of climate finance.

1.17 It is not only about the size of mitigation and adaptation finance, it remained as an extremely complex issue in terms of what it constitutes. The complexities of climate negotiations since 1992 can be gauged from the fact that the UNFCCC is yet to agree on an operational definition of climate finance. Without a definition of

[7] Decision 1 of the 21st session of the Conference of Parties

climate finance, it is nearly impossible to define adaptation finance. In other words, defining climate finance is a necessary condition to get a sense of what is adaptation finance. Further, adaptation finance is a much more complex issue, given the nature of the interventions. It is often commonly referred as finances that funds adaptation actions as adaptation finance. Though one may argue in these simplistic terms, it is an extremely complex issue. *Adaptation finance can be understood in terms of investments in activities that address current and expected effects of climate change. These are often part of mainstream development efforts, and can therefore be difficult to distinguish from wider investments for development. Indeed, mainstreaming the understanding of climate change risks and opportunities to respond into core development efforts is an important dimension of adaptation* (UNFCCC Biennial Assessment Report 2016). *Conventional development interventions, including those supporting sustainable livelihoods or social protection, can strengthen resilience and adaptive capacity, making it difficult to distinguish between good development and adaptation activities* (Levine, Ludi and Jones, 2011; Fankhauser and Burton, 2011; Jones et al., 2012). Climate Policy Initiative has defined adaptation finance as resources directed at activities for reducing the vulnerability of human or natural systems to the impacts of climate change and climate related risks, by maintaining or increasing adaptive capacity and resilience. The various steps for accounting of adaptation finance in a transparent manner have been explained in subsequent chapters.

1.18 An operational definition of adaptation finance as well as a common accounting methodology is necessary in order for a robust accounting and reporting of adaptation finance. This is more important in the context of commitment of various developing countries to follow the low carbon and climate resilient path to

progress is based on the assumption of availability of financial resources from developed world. A breakthrough in defining clearly what constitutes climate finance and thereby bringing transparency will be a significant achievement of the multilateral process on climate negotiations.

STATEMENT OF THE PROBLEM

1.19 The issues narrated above bring to the fore the importance of adaptation finance. Since the beginning of multilateral discourse on climate change, finance always played a critical role as an enabler. UNFCCC has recognized the crucial role finance plays and mandated industrialized countries to provide financial resources to the developing countries to take climate actions. Now more than a quarter of a century has passed, yet climate finance discussions lack a precise and adequate system of accounting modalities for financial resources. Measuring adaptation finance is more difficult given its complex connection with development finance and the absence of a common reference matrix. The consequence is that countries apply their own discretion while reporting the figures of climate finance provided. Simultaneously, the destination countries questions the claims by climate finance providers. At the domestic level, no comprehensive assessment of the budgetary spending on the various adaptation activities has been undertaken explicitly. Climate adaptation markers would considerably ease the identification of such activities. This can help in more accurate assessment of the resources India is spending on climate change adaptation. The objective of this Paper is to highlight and attempt to answer the pertinent questions that have not yet been convincingly responded when it comes to adaptation financing, what constitutes adaptation financing and various steps required to ensure transparency, credibility, measurability, verifiability and reportability. This research aims to bridge this gap.

RESEARCH OBJECTIVES

1.20 The research objectives are:

- To review the evolution of adaptation financing in the multilateral climate change regime since 1992 to till date.
- To examine what qualifies as adaptation finance
- To explain how adaptation finance should be reported and measured
- To analyse the magnitude of global adaptation financing flows in contrast to financing requirements
- To assess India's adaptation efforts and challenges for adaptation strategies particularly in a post Covid period.

RESEARCH STRATEGY AND RESEARCH DESIGN

1.21 The study employs basically a qualitative Research Strategy, although some amount of data is analyzed. The research design is Descriptive using review of climate change treaties and various COP decisions to the UNFCCC since 1992 to till date, important climate policy documents of Government of India, relevant secondary sources including books and scholarly articles, data on adaptation financing flows from various climate relevant funds and also from reports submitted by countries to the UNFCCC.

RATIONALE

1.22 Measuring and reporting of finance to address the adaptation concerns of climate change is essential to have a meaningful response to the serious problem of climate change. Even after a quarter century of multilateral climate discourse, climate finance discussions still lack a precise and adequate system of accounting modalities

for financial resources, as a result of which actual size of adaptation finance flows are also not known in contrast to the requirements. There have been serious concerns expressed by various countries regarding the numbers of adaptation finance reported. To put it differently, this lack of transparent rules leads to incomparable amounts being reported by countries applying their own discretion and judgement. How adaptation finance should be defined and accounted is still a matter of negotiations under the UNFCCC. Definitions and methodologies used need to be consistent with the international law on climate change. An assessment of India's adaptation efforts also need to be done. This paper makes an attempt to identify the components of adaptation finance so that transparent accounting and measurement of adaptation finance can be made.

RESEARCH QUESTIONS

1.23 The study would attempt to answer the following questions:

- How and why adaptation finance emerged as an important topic in the current discourse of climate change in contrast to the treatment attached to it in the early 1990s ?
- What are the adaptation efforts by India and the corresponding domestic resources spent on adaptation?
- What constitutes adaptation finance and how adaptation finance should be reported and measured?
- What is the projected financing requirements and current landscape of adaptation financing flows to developing countries?
- What are the various challenges for adaptation and strategies for future particularly in the context of global pandemic?

METHOD OF DATA COLLECTION AND LIMITATIONS

1.24 The research will be conducted through a desk-based analysis of secondary data which would be collated and analysed to review the implementation of the climate finance commitments under the international treaty. The research also includes secondary data sources and material available in the public domain with respect to India's expenditure on climate relevant adaptation. All Parties to the UNFCCC are required to submit their National Communications and Biennial Reports relating to their GHG inventory, national climate policies and measures, finances provided by developed countries, finances received by developing countries. UNFCCC's website will be collated and analysed to address the objectives of this research. Some of the relevant secondary data available are the following:

(a) International Climate Change Treaties and various COP decisions.

(b) Research papers by various think tanks and distinguished authors.

(c) Climate Policy Documents of Government of India

(d) Relevant Daily Periodicals and professional literature.

(e) Online sources

SCOPE

1.25 Though the multilateral treaties came into existence a quarter century ago, climate adaptation financing emerged as an important topic only some years ago and as such it has a relatively short history in the literature. Even so, there is a rich body of literature on the science of climate change, economics of climate change, the global policy architecture and the domestic climate policy framework. There are various pillars for climate policies and measures. There are important components other than finance such as technology, capacity building for an effective adaptation

strategy. However, these are beyond the scope of this study. The instant research is restricted to climate finance and specifically, the adaptation finance. After this introductory Chapter, the chapterization of the research study is as follows: Chapter 2 covers the literature Review with the objective of culling out material that is relevant for the purposes of this study; Chapter 3 focuses on the existing multilateral framework with respect to adaptation and its financing. It analytically explores how the treatment to adaptation as a climate response strategy emerged since the early years of implementation of the multilateral framework and the significant triggers in the treatment to adaptation and its financing in the climate treaties and relevant COP decisions; Chapter 4 describes the emerging climate scenario and climate vulnerabilities of India, examines the evolution of India's climate adaptation response in the domestic policy framework, analyses the current size of adaptation financing in India, and challenges for adaptation strategies including in the context of Covid-19 pandemic. Chapter 5 addresses the questions of what constitutes adaptation finance?; How it should be measured and reported?; and How adaptation finance is different from development aid?; Chapter 6 highlights the institutional arrangements for adaptation financing under the multilateral climate change regime. It also looks into the projected climate funding needs and analyses the current landscape of adaptation financing flows and the sources and destination countries; Finally, Chapter 7: sums up the study and offers some steps on the subject as way forward.

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CHAPTER 2: LITERATURE REVIEW

2.1 An international treaty on climate change was adopted in 1992 for concerted international action. It has near universal membership. India is also a Party to the UNFCCC and its related instruments. There is a recognition that climate change poses a major threat to the achievement of the developmental objectives of many developing countries. In addition to major environmental disruptions, unprecedented risk for the future economic well-being of humanity and the undermining of social welfare and equity is anticipated. Climate adaptation has a key role to play in determining how such climate impacts manifest on the ground and how much damage they cause.

2.2 The following questions have been explored in this study:

- How and why adaptation finance emerged as an important topic in the current discourse of climate change in contrast to the treatment attached to it in the early 1990s ?
- What are the adaptation efforts by India and the corresponding domestic resources spent on adaptation?
- What constitutes adaptation finance and how adaptation finance should be reported and measured
- What is the projected financing requirements and current landscape of adaptation financing flows to developing countries
- What are the various challenges for adaptation and strategies for future particularly in the context of global pandemic?

2.3 In this section, an attempt has been made to cull out material that is relevant for the purposes of this study. There are broadly three dimensions in the instant study: first is the scientific aspects of the subject of climate change; second is the

international response to the issue of climate change and the emergence of adaptation as a core response strategy and its financial challenges, and third is India's vulnerabilities to adverse impacts of climate change, its adaptation efforts and development imperatives.

2.4 The scientific basis of anthropogenic climate change has been emphasized in the various reports of the IPCC, since its establishment in 1988. IPCC has so far published five assessment reports and various special reports. These reports have contributed to the development in science and understanding on the climate issue. This includes coverage of scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts and options for adaptation and mitigation aspects. All the findings point towards the need to take climate change concerns seriously, inculcate a sense of awareness of the likely impacts and nature of problems and enhance interaction between policy makers, scientists and other stakeholders in order to progress towards holistic solutions. The First Assessment Report of the IPCC (1990) presented the physical science basis of climate change and stated that "*it is certain that there is a natural greenhouse effect which already keeps the Earth warmer than it would otherwise be and the emissions resulting from human activities are substantially increasing the atmospheric concentrations of the greenhouse gases"*. As regards vulnerabilities of various regions to adverse impacts of climate change, Fifth Assessment Report (IPCC, 2014) presents evidence for actual changes in climate patterns observed. Further, "Global Warming of 1.5 °C, Special Report (IPCC, 2018) stated that "*limiting global warming to 1.5°C would require rapid, far-reaching and unprecedented changes in all aspects of society*".

2.5 The second dimension is the international response. The study provides detailed insights into the evolution of climate change regime in the particular context of adaptation financing. For this purpose, a thorough review of all climate change treaties and various COP decisions to the UNFCCC since 1992 to till date are done. In this context, climate finance in the treaties was examined starting from the mother treaty *"United Nations Framework Convention on Climate Chan*ge (1992)" and the related legal instruments and COP decisions adopted till date. Adoption of UNFCCC was the first important step towards putting in place the institutions and processes for the world's Governments to take coordinated and effective action. Although global in scope, it differentiated the commitments/responsibilities of Parties on the basis of respective capabilities, economic structures, and resource bases and on the basis of *the principle of 'equity'*. A related instrument under the Convention "Kyoto Protocol" was adopted in 1997. At COP-13, Bali Action Plan (2007) was launched which was a comprehensive process to enable the full, effective and sustained implementation of the Convention through long-term cooperative action. Bali Action Plan placed emphasis on supporting urgent implementation of adaptation actions, taking into account the urgent and immediate needs of developing countries that are particularly vulnerable to the adverse effects of climate change. At COP-15 in Copenhagen in 2009, (Decision 2/CP.15, Copenhagen Accord[8]), climate finance was quantified as a concrete number for developing countries to scale up their mitigation actions and a flow of USD 100 billion a year by 2020 by the developed countries was mooted. A dedicated Green Climate Fund was also set up to provide support to developing countries. The *Cancun Agreements* adopted in 2010 at COP-16 (Decision

[8] Decision 2 of the 15th session of the Conference of Parties

1/CP.16[9]) constituted a set of significant decisions which included finance as a key category. The COP-17 at Durban (2011) decided to launch a process to develop a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties. The Paris Agreement (2015) was adopted under UNFCCC to enhance the implementation of the Convention and aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty.

2.6 A fundamental question is why adaptation lagged behind mitigation as a response strategy, in research and in the climate negotiations. Khor and Raman (2020), in their book "A Clash of Climate Change Paradigms: Negotiations and Outcomes at the UN Climate Convention" describe and analyse the process and outcomes of the UNFCCC from 2007 to 2019. It describes t*he twists and turns of years of the negotiations that started in Bali and the Bali Road Map, which went on later to adopt the Paris Agreement in 2015 and that continued with the wrangling over the interpretation of that Agreement and how it should be implemented in the 2016-2019*. Burton et al., (2002); (Arnell, 2009); (Doria et al., 2009) answers the question on adaptation not receiving the same attention as mitigation in the following way: *"in part this is because adaptation and development specialists, governments, NGOs, and international agencies have found it difficult to clearly define and identify precisely what constitutes adaptation, how to track its implementation and effectiveness, and how to distinguish it from effective development"*. A contributing reason is that adaptation has no common reference metrics in the same way that tonnes of GHGs or radiative forcing values are for mitigation. *The adaptation efforts are yet to be mainstreamed in many countries and still lagging behind mitigation*

[9] Decision 1 of the 16th session of the Conference of Parties

efforts. This is because its definitions are consistently broad and vague due to the lack of agreement over what constitutes adaptation (Hall, 2017; IPCC AR5, 2014).

2.7 An equally important question is what constitutes adaptation finance and how it should be measured and reported for assessment and evaluation of climate finance for ensuring the transparency and the credibility of multilateral process. A climate finance definition as well as a common accounting methodology is a crucial element. However, an analysis of the various climate finance decisions under the UNFCCC and its related instruments reveals that the adaptation finance landscape is more complex with a variety of actors with varied methodologies. Biennial Assessment Report of the Standing Committee on Finance (UNFCCC, 2016) concludes that "*adaptation finance can be understood in terms of investments in activities that address current and expected effects of climate change. These are often part of mainstream development efforts, and can therefore be difficult to distinguish from wider investments for development. Indeed, mainstreaming the understanding of climate change risks and opportunities to respond into core development efforts is an important dimension of adaptation"*.

2.8 Various other studies in the past have explained the complexities around adaptation finance accounting. There have been various claims about climate finance goal. The divide between the North and South on climate finance issues has always been clear in the climate negotiations. In 2015, a report titled "Climate Finance in 2013-14 and the USD 100 billion goal" claimed that developed countries provided USD 62 billion in climate finance in 2014 (OECD and CPI, 2015). However, the Indian Ministry of Finance questioned the claims in the Report through a discussion paper "Climate Change Finance, Analysis of a Recent OECD Report: Some Credible

Facts Needed" (Government of India, 2015) and stated that "*only USD 2.2 billion could be regarded as credible new and additional climate support*." India was supported by many developing countries on finance issue in the Paris Agreement negotiations. The Indian Ministry of Finance Paper raised serious questions about the credibility and accuracy of the figures so reported. A UNFCCC Report (2018) stated that, in fact, "*the total climate specific finance flows (self-reported figures) from Annex II Parties in 2016, amounts to around USD 38 billion which is less than 40 per cent of the USD 100 billion target of climate finance"*. In the run up to Katowice Conference in December, 2018, Indian Ministry of Finance had released a discussion paper on "3 Essential 'S's of Climate Finance- Scope, Scale and Speed – A Reflection" (Government of India, 2018). It questioned the methodologies used and found inconsistencies in the definitions of climate change finance used in various reports with the Convention provisions.

2.9 The latest Climate Finance Shadow Report (Oxfam, 2020) adds that: *(i) of the estimated USD 59.5bn in public climate finance reported by developed countries (annual average), climate-specific net assistance may be just USD 19–22.5bn; (ii) The net financial value of climate finance to developing countries – the grant equivalent – may be less than half of what is reported by developed countries; (iii) Due to over-reporting of climate relevance, bilateral climate finance could be around a third lower than reported; and (iv) Only an estimated 25 per cent of reported public climate finance was for adaptation and 66 per cent was for mitigation*. In another paper (Ray & Mauskar, 2019) observed that *"coverage of climate finance was ambiguous, the quantum was insufficient and pace of delivery of finance was slow"*.

2.10 As the issue of climate finance gained momentum, multilateral institutions also started tracking climate finance. The publication of their figures also could not resolve in any way the complexities and discrepancies in the accounting and reporting. A Joint Report on Multilateral Development Banks' Climate Finance started tracking the progress of climate finance targets. The Joint Report (2020), is a collaborative effort to make public MDB climate finance figures, together with an explanation of the methodologies for tracking this finance. However, the need for a better framework for evaluation of climate finance has been argued in many scholarly articles, papers and reports. According to a Report by Buchner Barbara, Brown Jessica and Morlo Jan Corfee (2011), "Monitoring and Tracking Long-Term Finance To Support Climate Action"**, "***there is a need for a better framework for measuring, reporting and verifying (MRV) climate finance*. *The overarching aim of an improved framework for MRV of long-term climate finance is to provide a clearer overview of international financial flows, trends, sources and purposes, so as to build trust among developed and developing countries through improved transparency and accountability, and to improve effectiveness of international action".*

2.11 Another important source of information is the Climate Funds Update (2020), which is an independent website that provides information and data on the growing number of multilateral climate finance initiatives designed to help developing countries address the challenges of climate change. Organization for Economic Co-operation and Development- Development Assistance Committee (OECD, DAC, 2018) publishes each year a climate-related development finance data set that includes over 8000 project level transactions, from bilateral and multilateral providers as well as philanthropic institutions. The data contain up to 50 different fields describing the institutional, financial and developmental characteristics of the

transactions. “Monitoring and Tracking Long-Term Finance to Support Climate Action”, (OECD, IEA, 2011), highlights the relevant information that needs to be tracked in order to build a comprehensive system for climate finance.

2.12 Another important issue is the projected funding needs in contrast to actual flows. Financing requirements have been estimated by various institutions/organizations. Though the estimates vary, all estimates runs into trillions of dollars. Bloomberg’s New Energy Outlook (2020) states that “*reducing emissions well below two degrees under clean electricity and green hydrogen pathway (100,000TWh of power generation by 2050) requires between USD 78 trillion and USD130 trillion of new investment between now and 2050”*. The OECD estimates that “*around USD 103 trillion of cumulative investment between 2016 and 2030 would be required for the International Energy Agency (IEA) 66% 2°C scenario, or 10% more than in a scenario where no further action is taken to mitigate climate change*.” The issue is more complex when one looks at adaptation finance.” A Report (UNEP, January 2021) estimates that *annual adaptation costs in developing countries currently is USD 70 billion*. The Report further states that adaptation costs in developing countries are “*expected to reach USD 140-300 billion in 2030 and USD 280-500 billion in 2050*”. A Government of India paper (2019), “Climate Summit for Enhanced Action: A Financial Perspective from India” examined various issues on climate finance comprehensively. The Paper makes an analysis of the post Paris Agreement developments and indicates that more actions need to be taken to meet objectives of the Paris Agreement, which in turn depends on the momentum of international climate finance, in terms of new and additional climate finance, technological and capacity building support.

2.13 As per the Independent Expert Group on Climate Finance published in UN "Delivering on the USD 100 Billion Climate Finance Commitment and Transforming Climate Finance" stated that *"the needs of developing countries are even greater in the aftermath of Covid-19 as the economic consequences have been particularly severe for Emerging Market and Developing Economies (EMDEs), drastically reducing both their domestic and international financing options."* Another source of estimate is Nationally Determined Contributions (NDCs). Preliminary estimates made by simply aggregating the finance needs in existing NDCs, with a conditional component under the Paris Agreement, amount to around USD 4.4 trillion (Weischer et al., 2016). In contrast to the requirements, actual finance flows are much lesser. The Biennial Assessment Report of the Standing Committee on Finance (UNFCCC, 2018) provides an overview of current climate finance flows. The Report outlines that "*total climate specific finance flows from Annex II Parties in 2016, amounts to around USD 38 billion which is less than 40 percent of the USD 100 billion target of climate finance*." The Report also mentions aggregate flows for mitigation remains greater than support for adaptation across all sources. Adaptation received only 29 percent and 25 percent of the bilateral fund flows and multilateral fund flows respectively during 2015-16.

2.14 Climate Policy Initiative Report (2019) provides relevant information on global landscape of climate finance. Standing Committee on Finance also produced a technical Report on Biennial Assessment and Overview of Climate Finance Flows (UNFCCC, 2018). What these studies point out that there are still significant gaps in financing climate actions. Oxfam (2020) provided an assessment of USD 100 billion goal that states, "*the aggregated climate finance, estimated as net climate-specific*

assistance, is far lower than the reported climate finance and the new climate-specific assistance may be just USD 16-21 billion".

2.15 The third dimension analysed in this study is India's vulnerabilities to adverse impacts of climate change, its adaptation efforts and development imperatives. For the purpose of analysing this section, the study looked into important climate policy documents of Government of India since 1992. India's first National Communication to the UNFCCC (Government of India, 2004) states that Indian climate variability is higher than the average global variability because of the monsoon. The recent climate trends and recent variations in the Indian context have been elaborated in India's Biennial Update Report to the UNFCCC (Government of India, 2018). This Report observes that *"...out of the 36 States and Union Territories in the country, 27 are disaster prone. 12% land is prone to flood and river erosion; of the around 7,500 km coastline, 5,700 km is prone to cyclones; 68% of the cultivable land is vulnerable to drought; hilly areas are at risk from landslides and avalanches; and 15% of the landmass is prone to landslides".*

2.16 The need for adaptation measures have been addressed through domestic efforts and are reflected in India's climate policy documents adopted from time to time. In this regard, "National Action Plan on Climate Change", (Government of India, 2008**)** was studied. Emphasizing the overriding priority of maintaining high economic growth rates to raise living standards, the Plan "*identifies measures that promote development objectives while also yielding co-benefits for addressing climate change effectively*." Further, "India's Intended Nationally Determined

Contribution to UNFCCC: Working towards Climate Justice", (Government of India, 2015) was examined with respect to India's promised climate actions post 2020.

2.17 Turning to the subject of India's adaptation expenditures**,** Ray (2008) argued that India is spending significant resources on adaptation relevant actions and highlighted lessons learned from implementing development schemes and policies, which have incorporated adaptation due to the increasing incidence of extreme weather events. In contrast, the study by Ganguly, Kaushik and Gyana Ranjan Panda (2010),"Adaptation to Climate Change in India." Centre for Budget and Governance Accountability and Oxfam India made an attempt to understand the existing public finance framework through a study of the Union Budgets for years 2006-07 to 2009-10 on adaptation. The study concludes that resources devoted to vulnerable sectors are more development oriented and adaptation priorities in these sectors need to be identified and prioritized apart from provisioning of additional resources. However, funding for adaptation is a major issue. Ray & Mauskar (2018) argued that *understanding the realities of climate finance is key to agreement on strategies to combat global warming and without sufficient climate finance, even the proposed NDCs would not fructify, leave alone any enhanced level of ambition*.

2.18 Estimates of India's adaptation costs have been gathered from the Report of the Sub-Committee on assessing financial requirements for India's NDC (Government of India, 2020). It observes that "*Climate change impacts are expected to worsen with the passage of time because of the momentum due to present carbon stock continuing to raise the temperature. Hence, India's adaptation needs will have to be intensified and so the adaptation costs will increase"*.

2.19 Another important point in India's context is its development imperatives. Mauskar (2014*)* described the constitutional and development imperatives of India in the context of sustainable development. As a growing economy striving to achieve a better standard of living for its citizens, the developmental needs will also increase. Substantial efforts are still required to strengthen food security, provide adequate housing, access to energy, and ensure full access to basic social services. Climate-induced events and disasters are growing, putting an enormous, additional and unjustified burden on the country's developmental challenges.

2.20 Gender dimensions and adaptation efforts is another imperative in devising appropriate adaptation measures, with special focus on women. Gender responsive climate actions of India cuts across various sectors and these have been collated from various reports. According to Mckinsey Global Institute (November 2015), *"India's economy would have the highest relative boost among all regions of the world if its women participated in paid work in the market economy on a similar basis to men, erasing the current gaps in labour-force participation rates, hours worked, and representation within each sector."*

2.21 In addition to the specific references mentioned above, various relevant reports of Multilateral and Bilateral Institutions, individual papers and scholarly articles and miscellaneous papers have been reviewed in the context of the purposes of the overall study.

2.22 The above literature review reveals that various studies and reports have recognized that measuring and reporting of finance to address the adaptation

concerns of climate change is essential to have a meaningful response to the serious problem of climate change. The above analysis also indicates that there are differing views, claims and counter claims about the actual flows of finance. The way forward is actually capturing the data at a granular level in a transparent way through an agreed template, which is the key to build the trust among countries and is essential for addressing an issue of global concern. This would bring the credibility and accuracy of the numbers reported and also addresses the principles of adequacy and predictability. Through this study, I sought to better understand how to identify the components of adaptation finance so that transparent accounting and measurement of adaptation finance can be made, capture the actual size of adaptation finance flows in contrast to the requirements, and an assessment India's adaptation efforts.

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CHAPTER 3: ADAPTATION AND ITS FINANCING IN CLIMATE TREATIES AND DECISIONS OF THE CONFERENCE OF PARTIES TO THE UNFCCC

3.1 This Chapter first examines the physical science basis of climate change as provided by the state of knowledge by IPCC. The Chapter also explores the significant triggers in the treatment to adaptation strategies and its financing that has taken place since the adoption of the Convention in comparison to mitigation. It also provides a perspective on how climate change adaptation and its financing have unfolded in the multilateral discourse since the adoption of Convention.

THE PHYSICAL SCIENCE BASIS OF CLIMATE CHANGE

3.2 In 1988, United Nations endorsed the creation of IPCC. In its resolution, the UN stated *"certain human activities could change global climate patterns, threatening present and future generations with potentially severe economic and social consequences; and continued growth in atmospheric concentrations of greenhouse gases could produce global warming with an eventual rise in sea levels, the effects of which could be disastrous for mankind if timely steps are not taken at all levels."* The major task of the IPCC is to prepare a comprehensive review of the state of knowledge of the science of climate change; the social and economic impacts of climate change, and make recommendations on the potential response strategies. The IPCC has so far published five assessment reports on climate change.

3.3 The first Assessment Report of the IPCC (1990) stated that *it is certain that there is a natural greenhouse effect which already keeps the Earth warmer than it would otherwise be; emissions resulting from human activities are substantially*

*increasing the atmospheric concentrations of the greenhouse gases. These increases will enhance the greenhouse effect, resulting on average in an additional warming of the Earth's surface. The Report stated with confidence that CO_2 has bee*n respon*sible for over half the enhanced greenhouse effect in the past, and is likely to remain so in the future. The atmospheric lifetimes of the gases are determined by their sources and sinks in the oceans, atmosphere and biosphere.* CO_2*, chlorofluorocarbons and nitrous oxide are removed only slowly from the atmosphere and hence, following a change in emissions, their atmospheric concentrations take decades to centuries to adjust fully. Even if all human-made emissions of CO_2 were halted in the year 1990, about half of the increase in* CO_2 *concentration caused by human activities would still be evident by the year 2100.*

3.4 Ever since the Industrial Revolution began, man-made activities have added significant quantities of GHGs to the atmosphere. Global warming is the consequence of the stock of greenhouse gas emissions, chiefly CO_2, which has accumulated in the Earth's atmosphere as a result of fossil fuel based activity in the highly industrialized countries of the world. In the history of civilization, the economic progress has been largely influenced by the use of fossil fuels as the major energy source. World-wide economic growth and development in the past did demand increasing amounts of energy as economic growth has a strong influence on energy consumption. Industrialization coupled with highly energy intensive production and consumption in these countries has led to the present state of affairs. Industrialized countries emitted GHGs to generate energy and through the production and consumption of energy became prosperous. Today, the developed countries have capital stock, infrastructure, resilience etc. In contrast, the new asks on developing countries for reducing emissions have intensified. In fact, no country in the world has

been able to achieve a Human Development Index of 0.9 or more without an annual energy supply of at least 4 tonne of oil equivalent (toe) per capita. Government of India (2019) stated that "t*o achieve per capita GDP comparable to that of the upper-middle-income countries, India requires greater energy resources and that too at a rapidly increasing rate. Only with an assured increase of per capita energy consumption by 2.5 times, India will be able to increase its real per capita GDP to USD 5000 (in 2010 prices)*[10]. Even today, 60 percent contribution to the stock of GHG emissions are from developed countries (Table 3.1).

Table 3.1: Cumulative CO_2 emissions in 2019 by world region[11]

Region/Country	Share in percent
Asia (excl. China & India)	14.62
China	13.65
India	3.22
Africa	2.85
Oceania	1.27
South America	2.58
North America (excl. USA)	3.69
United States	25.46
EU-27	17.82
Europe (excl. EU 27)	14.83
Total	100
Source: https://ourworldindata.org	

3.5 The science of climate change has been pointing towards various adverse effects of climate change. It is often met with market failures as climate change is a global externality associated with the emission of GHGs, which has long, persistent

[10]Government of India(2018-19), Economic Survey

[11] Note: The above table shows cumulative carbon dioxide (CO_2) emissions by region from the year 1750 and onwards. Emissions are based on territorial emissions (production-based) and do not account for emissions embedded in trade. This measures CO_2 emissions from fossil fuels and cement production only – land use change is not included.

and, beyond a level, irreversible effects. In its Fifth Assessment Report (2014), IPCC categorically concluded that climate change is real and the main cause for this is human activities. *Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and oceans have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of GHGs have increased. The IPCC Report explained that from 1880 to 2012, the average global temperature increased by 0.85°C; oceans have warmed, the amounts of snow and ice have diminished and the sea level has risen. Given current concentrations and ongoing emissions of greenhouse gases, it is likely that by the end of this century global mean temperature will continue to rise above the pre-industrial level.* Limiting climate change will require substantial and sustained reductions of greenhouse gas emissions.

3.6 The IPCC also comes out with special reports. In its Special Report (October 2018), it informed that it is still possible to limit climate change to 1.5°C if—and only if—there are rapid, far-reaching and unprecedented changes in all aspects of society. Key findings of IPCC Special Report (October 2018) are given in Box 3.1.

Box 3. 1: Key Findings of IPCC Special Report (October, 2018)

- Limiting global warming to 1.5ºC would require rapid, far reaching and unprecedented changes in all aspects of society. Global net human-caused emissions of CO_2 would need to fall by about 45 percent from 2010 levels by 2030, reaching 'net zero' around 2050. This means that any remaining emissions would need to be balanced by removing CO_2 from the air.

- With clear benefits to people and natural ecosystems, limiting global warming to 1.5ºC compared to 2ºC could go hand in hand with ensuring a more sustainable and equitable society.

- We are already seeing the consequences of 1°C of global warming through more extreme weather, rising sea levels and diminishing Arctic sea ice, among other changes.

- A number of climate change impacts could be avoided by limiting global warming to 1.5ºC compared to 2ºC, or more. Every extra bit of warming matters, especially since warming of 1.5ºC or higher increases the risk associated with long-lasting or irreversible changes, such as the loss of some ecosystems.

- Limiting global warming would also give people and ecosystems more room to adapt and remain below relevant risk thresholds.

Source: IPCC

EXISTING MULTILATERAL FRAMEWORK

3.7 The science of climate change presented in the first assessment report of the IPCC played a decisive role in the creation of the key international treaty to reduce global warming and cope with the consequences of climate change.

The UNFCCC

3.8 To address the concerns of climate change in a globally coordinated manner, the UNFCCC sets an overall framework for intergovernmental efforts to tackle the challenge posed by climate change. It recognizes that the climate system is a shared resource whose stability can be affected by industrial and other emissions of CO_2 and other GHGs. Adopted in 1992, UNFCCC entered into force on 21 March 1994. The

Convention enjoys near universal membership. India ratified the Convention on November 1993. The Convention aims *at stabilization of GHG concentration in the earth's atmosphere at a level that would prevent dangerous atmospheric interference with the climate system*.

3.9 The preambular para of the Convention noted that *"the largest share of historical and current global emissions of GHGs has originated in developed countries, that per capita emissions in developing countries are still relatively low and that the share of global emissions originating in developing countries will grow to meet their social and development needs".* Keeping in view the historical contributions of industrialized countries, the Convention called them to take a leading role in addressing climate change and the adverse effects thereof. The preambular paras also affirmed that *"responses to climate change should be coordinated with social and economic development in an integrated manner with a view to avoiding adverse impacts on the latter, taking into full account the legitimate priority needs of developing countries for the achievement of sustained economic growth and the eradication of poverty*." It also recognized that *"all countries, especially developing countries, need access to resources required to achieve sustainable social and economic development and that, in order for developing countries to progress towards that goal, their energy consumption will need to grow taking into account the possibilities for achieving greater energy efficiency and for controlling GHG emissions in general, including through the application of new technologies on terms which make such an application economically and socially beneficial".*

3.10 Article 3, para 1 of the Convention states that "*the Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated*

responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof". In other words, although global in scope, UNFCCC differentiates the commitments/responsibilities of Parties on the basis of historic responsibilities, and on the basis of the principle of 'equity' and common but differentiated responsibilities. The principles clearly endeavor for human welfare.

3.11 In terms of commitments under the Convention, various paras in Article 4 are amply clear (Box:3.2). Apart from mitigation, adaptation and provision of means of implementation including finance, technology and capacity building are also climate actions. In essence, developed countries are required to adopt national policies and measures for limiting their anthropogenic GHG emissions and protecting and enhancing the GHG sinks and reservoirs. The countries are required to inform the COP, the supreme body of the UNFCCC, of their progress on these fronts. The UNFCCC reviews the implementation of the Convention at annual meetings of the COP. The developing countries are also required to take actions for addressing climate change, taking into account their development priorities, objectives and circumstances. The Convention explicitly recognizes the development imperatives of developing countries. The Convention also set up a Financial Mechanism for providing financial resources to countries on a grant or concessional basis, including for the transfer of technologies. The Mechanism functions under the guidance of and is accountable to the COP.

Box 3. 2: Important climate finance articles in UNFCCC

Article 4.3 "The developed country Parties and other developed Parties included in Annex II shall provide new and additional financial resources to meet the agreed full costs incurred by developing country Parties."

Article 4.4 " The developed country Parties and other developed Parties included in Annex II shall also assist the developing country Parties that are particularly vulnerable to the adverse effects of climate change in meeting costs of adaptation to those adverse effects"

Article 4.5 The developed country Parties and other developed Parties included in Annex II shall take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies and know-how to other Parties, particularly developing country Parties, to enable them to implement the provisions of the Convention".

Article 4.7 "The extent to which developing country Parties will effectively implement their commitments under the Convention will depend on the effective implementation by developed country Parties of their commitments under the Convention related to financial resources and transfer of technology and will take fully into account that economic and social development and poverty eradication are the first and overriding priorities of the developing country Parties".

Source: UNFCCC

3.12 Responses to climate change involve two strategies: climate change mitigation and climate change adaptation. Efforts to reduce emissions and enhance sinks are referred to as "mitigation" and "adaptation" to climate change involves reducing the vulnerability to the harmful effects of climate change. The common thread in all the chapters is that the Paper overall focuses on the importance of adaptation measures and the required finances to implement meaningful adaptation actions on the ground especially from a developing country perspective. In spite of the initiatives taken to mitigate the GHGs being emitted into the atmosphere, the earth is likely to experience a certain degree of change in the climate. These changes are likely to impact all natural and human systems though the nature of impacts and their severity shall vary from region to region. Therefore, an analysis of sector specific vulnerabilities is imperative to comprehend the current and future risks to

climate in order to initiate necessary and timely action in response to these risks. Furthermore, vulnerability assessments can facilitate the identification of sectoral opportunities that can be explored by minimizing the anticipated risks and overcoming the challenges in a targeted manner. There has also been considerable variation in the way adaptation has been defined (OECD 2006). Table 3.2 provides various definitions of adaptation as defined by different organisations.

Table 3.2: Common defnitions of adaptation.	
Intergovernmental Panel on Climate Change (2007)	Adaptation is an adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished, including anticipatory, autonomous, and planned adaptation
UNFCCC	Adaptation refers to adjustments in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects or impacts. It refers to changes in processes, practices, and structures to moderate potential damages or to benefit from opportunities associated with climate change
United Nations Development Program (2005)	Adaptation is a process by which strategies to moderate, cope with and take advantage of the consequences of climatic events are enhanced, developed, or implemented.
United Kingdom Climate Impacts Program (2003)	Adaptation is the process or outcome of a process that leads to a reduction in harm or risk of harm, or realisation of benefits, associated with climate variability and climate change
Source: B. Biagini et al. (2014)	

Kyoto Protocol

3.13 In 1997, Parties to the UNFCCC adopted the Kyoto Protocol in recognition of necessity for strengthening developed countries' commitment in furtherance to the objectives of the Convention. The Protocol provided for quantified emission limitation and reduction commitments for the developed countries. Kyoto Protocol also placed responsibilities on developed countries to provide finance and technology to developing countries to assist them in undertaking climate-related responsibilities.

The Kyoto Protocol entered into force on 16 February 2005. The Protocol also provided for three mechanisms that enable the developed countries with quantified emission limitation and reduction commitments to acquire GHG reduction credits from activities outside their own boundaries at relatively lesser costs. These were Joint Implementation, Clean Development Mechanism (CDM) and Emission Trading. Developing Countries could participate only in CDM. Under CDM, a developed country would take up GHG reduction project activities in a developing country where the cost of GHG reduction project activities is usually much lower. CDM projects can earn saleable certified emission reduction (CER) credits, each equivalent to one tonne of CO_2, which can be counted towards meeting Kyoto targets. Developed countries agreed to reduce emissions collectively by 5.2 per cent during the first commitment period (2008 to 2012) compared to 1990 levels. The COP-18 at Doha adopted the decision regarding the Kyoto Protocol's second commitment period (2013 to 2020) with the emission reduction of Annex 1 Parties by 18 per cent. An Adaptation Fund has also been established with 2 per cent levy from the proceeds under CDM.

Paris Agreement

3.14 At the 17th session of the COP at Durban in 2011, Parties recognized the need for a comprehensive plan after 2020 towards achieving the ultimate objective of the Convention. A process was launched to develop a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties. The process was completed at COP-21 in Paris in December 2015 with the adoption of the Paris Agreement, a related legal instrument under the Convention. The Paris Agreement entered into force on November 4, 2016. As of January, 2021, it has been ratified by 190 countries. India ratified the Paris Agreement on 2nd October 2016.

3.15 The Purpose of the Agreement notes that the Agreement is to enhance the implementation of the Convention. Article 2.1 mentions *"This Agreement, in enhancing the implementation of the Convention, including its objective, aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty".* It further states in para 2, Article 2 that "*The Agreement will be implemented to reflect equity and the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances.*"

3.16 The adoption of Paris Agreement marked a milestone in the global collective action in the field of containing climate change and its adverse effects. The Agreement is not mitigation-centric and includes adaptation, finance, technology and capacity building as equal pillars. The important role of finance as an enabling factor is reiterated in Article 9 of the Paris Agreement. Article 9.1 mandates an obligation on the developed countries to provide financial resources to developing countries for undertaking both mitigation and adaptation actions. Specifically on Adaptation, Article 7.9 of the Paris Agreement states*: "Each Party shall, as appropriate, engage in adaptation planning processes and the implementation of actions, including the development or enhancement of relevant plans, policies and/or contributions...".* The Paris Agreement acknowledges and recognizes the development imperatives of developing countries, supports their right to develop and their efforts to harmonize development with environment. The Agreement refers to the differentiation between the actions of developed and developing countries in all its relevant clauses and the principle of common but differentiated responsibilities in the light of different

national circumstances has been maintained across all pillars of the Agreement including finance. Paris Agreement seeks to raise ambitious action by each country by basing it on a country-driven approach with the contribution by each country to the global fight against climate change determined at national level.

Bindingness of climate actions in the Paris Agreement

3.17 Bindingness is a key clause while considering compliance matters in treaty provisions. Binding provisions are indicated by the use of verbs like 'shall', and 'are to undertake'. On the other hand, aspirational or normative provisions use the verbs such as 'may', 'should', 'seek to' and 'recognising'. There are number of binding paras in the Paris Agreement including in the Articles 7 and 9 on adaptation and finance respectively. For example, Adaptation Article 7: Paras 11&13 and Finance Article 9: Paras 1, 5& 7 implies the bindingness. Here, bindingness, specifically is on reporting rather than the results or strictly with the provision of climate finance. It is clear that reporting provisions is binding on the countries to report very promptly, accurately and correctly in a transparent manner including the finance provided by developed countries as it is a compliance matter. The objective here is to hold each country accountable for what it reports. The compliance mechanism under the Paris Agreement Work Programme (PAWP) permits a Compliance Committee and it can step in if there is adverse transparency findings (for eg. significant inconsistencies in reporting).

Nationally Determined Contributions (NDCs)

3.18 The Paris Agreement requires all Parties to put forward their best efforts through NDCs and strengthen these efforts in the years ahead. NDCs outlines post 2020 period climate actions. Each Party's successive NDC will have to be a

progression of previous efforts. A significant number of Parties included adaptation component in their NDCs. Following elements featured in adaptation components (UNFCCC, 2016[12]):

(a) National circumstances informing the adaptation component;

(b) Long-term goals and/or visions guiding the adaptation component;

(c) Impacts and vulnerability assessments;

(d) Legal and regulatory frameworks, strategies, programmes and plans, which provide the basis for, or have informed, adaptation actions;

(e) Measures or actions planned or under implementation in specific areas;

(f) Means of implementation;

(h) Monitoring and evaluation of adaptation;

(i) Synergies between mitigation and adaptation.

Sustainable Finance versus Climate Finance

3.19 The year 2015 also witnessed the adoption of 2030 Development Agenda with its 17 sustainable development goals (SDGs). This raises the issue of mobilizing capital for achieving these goals. Subsequently, there have been international initiatives emphasizing the need for mobilizing sustainable finance. The SDGs are aspirational goals and the targets accordingly are fixed. In contrast, climate change is an externality and therefore it is an imperative for developing countries. However, the available literature often uses the terms: 'sustainable finance', and 'climate finance' interchangeably. Climate finance is not a synonym of sustainable finance. These terms are different in its implications. Though, there are considerable overlaps and one may subsume the other, it has to be understood that provision of climate finance is under a multilateral legal treaty whereas sustainable finance is

[12] UNFCCC, "Synthesis Report on the aggregate effect of NDCs", May 2016

what global community can strive and achieve. The imperatives of climate finance have to be fulfilled by the multilateral climate regime conforming to the principles and provisions of UNFCCC and Paris Agreement. To elaborate the point- sustainable finance covers a broader set of investment universe with the aim to build an inclusive economically, socially and environmentally sustainable world; and climate finance refers to financing that seeks to support mitigation and adaptation actions that will address climate change. The broad set of principles for shaping the sustainable finance taxonomy may include, among other things, alignment to activities that achieve low carbon and climate resilient pathways- alignment of national objectives to govern flow of resources towards SDGs and classification of activities at sector and sub sector level- clean energy, energy efficiency, clean transportation, sustainable agriculture and land use, water use and conservation and climate adaptation etc.

ADAPTATION IN CLIMATE TREATIES AND COP DECISIONS

3.20 Although both mitigation and adaptation are strategies to respond to climate change, there has been striking differences in the way both the strategies were treated in the initial years of implementation of UNFCCC. This chapter focuses on adaptation and its financing. It also provides a perspective on how climate change adaptation and its financing have unfolded in the multilateral discourse since the adoption of the Convention.

From Rio to Bali

3.21 The UNFCCC adopted during the Earth Summit in Rio De Janeiro recognized the vulnerability of all countries to the effects of climate change and called for efforts to address the adverse consequences, in particular, in vulnerable

developing countries. Historically, cooperation has been talked of largely in the context of mitigation efforts though there is a need to understand the requirements for adaptation. Consequently, adaptation received less attention in comparison to mitigation in the early years. Adaptation gained attention in the climate discourse with the release of IPCC Reports as a result of which Parties agreed on a process to address adverse effects and to establish funding arrangements for adaptation. At present, adaptation agenda is a matter of discussion under various bodies of the Convention.

3.22 The term "adapt" and "adaptation" have been mentioned only 6 times in the text of the Convention. The Convention does not define adaptation and no Article has been exclusively devoted to adaptation. This probably meant a restriction of formal space in the initial years of multilateral discourse on adaptation. Nevertheless, it was an important constituent in the text of Convention, including in its Article 2 on ultimate objective and various key articles (Box 3.3).

Box 3. 3: Adaptation in the text of the UNFCCC

Article 2: The ultimate objective of the Convention is to "stabilize of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change….".
Article 3.3: "…Policies and measures should take into account different socio-economic contexts, be comprehensive, cover all relevant sources, sinks and reservoirs of greenhouse gases and adaptation, and comprise all economic sectors".
Article 4.1(b): "Formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing ...measures to facilitate adequate adaptation...".
Article 4.1(e) : "Cooperate in preparing for adaptation to the impacts of climate change…".
Article 4.1(f): "Take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions, and employ appropriate methods, …., with a view to minimizing adverse effects on the economy, on public health and on the quality of the environment, of projects or measures undertaken by them to mitigate or adapt to climate change".
Article 4.4: "The developed country Parties…shall also assist the developing country Parties that are particularly vulnerable to the adverse effects of climate change in meeting costs of adaptation to those adverse effects."

Source: UNFCCC

3.23 The Article 4.4 mentions adaptation in the context of centrality to financing. The Convention also set up a Financial Mechanism. The Article 11 of the Convention states "*A mechanism for the provision of financial resources on a grant or concessional basis, including for the transfer of technology, is hereby defined. It shall function under the guidance of and be accountable to the Conference of the Parties, which shall decide on its policies, programme priorities and eligibility criteria*".

3.24 At COP-1 itself in Berlin 1995, the adaptation concern was addressed in which it laid down policies, programme priorities and eligibility criteria for the operating entities, under the financial mechanism for funding the adaptation activities and mentioned that funding is to be provided by developed countries to developing countries. It listed different stages for adaptation activities and funding. While stage I stated about planning, studies of possible impacts of climate change, identifying vulnerable countries and policy options for adaptation, stage II mentioned measures for further capacity building to prepare for adaptation and stage III covered measures to facilitate adequate adaptation. However, the decision was short of any explicit work programme on adaptation. All the initial COPs were dedicated to negotiating the instrument for reducing GHG emissions which was later resulted in adoption of the Kyoto Protocol.

3.25 A breakthrough in the treatment meted to the issue of adaptation took place with the release of the Third Assessment Report of the IPCC in 2001, which brought out clear evidence on "changing weather patterns and the need for adaptation actions along with mitigation" and provided the impetus for substantive work on adaptation under the Convention. The COP-7 held in Marrakech, Morocco,

in 2001 took note of the science on adaptation and Marrakech Accords was adopted, which included some critical elements on adaptation, thereby providing a formal legal space for discourse on adaptation. In 2004 at COP-10, the Buenos Aires programme of work on adaptation and response measures was adopted to develop methodologies to deal with adverse effects of climate change, reporting vulnerability assessment and adaptation measures in countries' National Communication and collecting and disseminating information among Parties. At COP-11 in 2005, a work program on impacts, vulnerability and adaptation was adopted to support developing countries understand and measure vulnerability and adaptation. Institutional financial structures such as the Special Climate Change Fund (SCCF), the Least Developed Countries Fund (LDCF) and an Adaptation Fund were set up. However, it was still nothing concrete with finances as a key enabler and climate finance as a whole remained a highly politicized debate.

3.26 The Fourth Assessment Report of IPCC (2007) was released which stated that "more extensive adaptation than earlier was required to reduce the future vulnerability as a result of the GHG concentration in the atmosphere due to past emissions". When the Parties met at COP-13 in Bali in 2007, there were huge demands from developing countries to recognize adaptation. The result is that Bali Action Plan established enhanced action on adaptation as a separate building block. It stressed international cooperation, technology development and transfer and enhanced financial support .

From Poznan to Paris

3.27 The demand for adaptation agenda discussion by the developing countries was often accompanied with demand for adaptation finance. This helped in bringing

the focus and attention to financing adaptation and the operationalizing the institutions and bodies created in the next sessions. The Cancun Adaptation Framework adopted at COP-16 in 2010 provided adaptation the same status as mitigation. A dedicated climate Fund, the GCF under the COP was established and it was decided that a significant share of the multilateral funding for adaptation would flow through the GCF. At COP- 17 (2011), the COP invited developing countries to prepare National Adaptation Programmes. An Adaptation Committee was established to promote implementation of enhanced action on adaptation. During this period, a large amount of work was focused on balanced allocation for adaptation activities and this period also coincided with the preparations for a new global pact, the Paris Agreement. In the run- up to Paris Agreement negotiations, the developing countries as a group were very clear about the focus to be given to adaptation in the new global pact. Developing countries strongly argued, the result of which is the parity in the treatment achieved between mitigation and adaptation. The Paris Agreement has several articles mentioning adaptation concerns, in addition to Article 7 which is dedicated to adaptation. In the reference to the section on global stocktake (in Article 14), it states that the stocktake "shall" "review the adequacy and effectiveness of adaptation and support provided for adaptation" as well as "review the overall progress made in achieving the global goal on adaptation…" .

Post Paris Developments- Katowice outcomes

3.28 Post Paris, it still remained a big challenge to keep up the momentum achieved on adaptation discussion while negotiating the implementation arrangements of the PAWP. Developed and developing countries continue to

exchange contrasting views. Developed countries were of the view that countries should focus on mitigation guidelines whereas developing countries strongly emphasized the comprehensiveness of the Agreement including adaptation and means of implementation. At COP-24 held in Katowice, Poland (2018), the Parties adopted a set of guidelines for implementing the Paris Agreement. A number of fierce exchanges of words went on prior to the adoption of Katowice Climate Package. At the conclusion of COP- 24, the Group of 77 and China representing the developing countries said that it 'did not see a level of balance', as it saw 'a mitigation regime in the making, with urgent adaptation needs relegated to second-class status.'

3.29 The cornerstone of Paris Agreement lies in its Article 4 which states that the *'Each Party shall prepare, communicate and maintain successive NDCs that it intends to achieve.'* The policy document being nationally determined, the Katowice decision rightly stated that apart from providing information on the mitigation efforts, Parties can also include an adaptation component, and developing countries can also include other information such as finance, technology transfer and capacity-building needs. The Paris Agreement mandates Parties to agree on the guidance for the information to be provided to facilitate the clarity, transparency and understanding (CTU) of the NDCs. During the course of negotiations, the only point that witnessed consensus among Parties was that NDC is 'nationally determined'. Two issues that saw divergences between developed and developing countries were (i) how differentiation would be reflected between developed and developing countries in relation to the guidance on the information for the CTU, given the different nature of their NDCs; and (ii) the scope of the NDCs (only about mitigation or it includes adaptation and the means of implementation). In the decision adopted on the

information to be provided for the NDCs, Parties are required to provide the information necessary for CTU in relation to NDCs.

3.30 During the negotiations, concerns were expressed by developing countries that the proposed transparency guidelines enhance the obligations of developing countries, with no enhancement of the same by developed countries. Some developing countries were of the view that there cannot be common reporting guidelines for both developed and developing countries in relation to their climate actions as they had different capacities. Developing countries also wanted stronger rules on reporting and review in relation to the provision of the means of implementation by developed countries. It was decided that Parties shall submit their first biennial transparency report (BTR) and national inventory report, in accordance with the modalities, procedures and guidelines (MPGs), latest by 31 December 2024. In the transparency framework decision, flexibilities in the scope, frequency and level of reporting is provided for developing countries that need it in the light of their capacities and this is to be self-determined.

3.31 As regards climate finance decisions at Katowice, Article 9.5 mandates developed countries to biennially communicate ex-ante information on the projected levels of public financial resources to developing countries. The decision adopted regarding Article 9.5 recognized the "importance of predictability and clarity of information on financial support for the implementation of the Paris Agreement" and reiterated that developed countries "shall biennially communicate indicative quantitative and qualitative information…projected levels of public financial resources to be provided" to developing countries. The decision also requests the

Secretariat "to establish a dedicated online portal for posting and recording the biennial communications." The Secretariat is also requested "to prepare a compilation and synthesis of the information included in the biennial communications …starting in 2021…with a view to informing the global stocktake". The decision ensured a balance between adaptation and mitigation.

3.32 The wrangling between developed and developing countries in relation to what they should report in the MPGs was reflected in the discussions on Article 9.7. Developing countries sought information on how the support provided and mobilized portrayed an advancement from previous levels provided to developing countries, including on how the finance provided is new and additional. They also wanted the reporting to include information on the grant equivalency of the financial instruments used and the loan repayments by developing countries, in order to ensure that this was not counted as climate finance. After long and protracted discussions, the developing country demands on information on progression, what is new and additional and the grant equivalence of the instruments used were in the decision as part of reporting arrangements under the transparency framework. Developing countries also desired a process on setting a new collective quantified goal on finance, that accounts their needs and priorities from a floor of USD 100 billion per year, as mandated by a decision agreed to in Paris in 2015. The Paris decision text, in para 54, states that the goal to be set prior to 2025. In the adopted decision, Parties agreed to initiate in Nov 2020, "*deliberations on setting a new collective quantified goal from a floor of USD 100 billion per year*".

Madrid Outcomes

3.33 At COP-25 in Madrid in December 2019, the North South divide was again very clear. Developing countries expressed disappointment, stressed the urgency of climate actions and enhancing ambition means ambition in adaptation and on the means of implementation, apart from mitigation efforts. They continuously recalled Article 3 of the Paris Agreement, which is a comprehensive Article which establishes that NDCs are not mitigation-centric and stressed that all aspects of ambition must be included. The final Madrid decision that was adopted on adaptation, *"calls on Parties to engage in adaptation planning processes and the implementation of actions.''*. The decision also requests the 'Adaptation Committee to consider approaches to reviewing the overall progress made in achieving the global goal on adaptation and to reflect the outcome of this consideration in its 2021 annual report'. The decision 'underlines the importance of implementing commitments under the Paris Agreement related to finance, technology transfer and capacity-building to address the mitigation and adaptation needs and priorities of developing countries 'and 'recalled that the provision of scaled-up financial resources should aim to achieve a balance between adaptation and mitigation, taking into account country-driven strategies, and the priorities and needs of developing country Parties, considering the need for public and grant-based resources for adaptation'.

3.34 The COP-25 decisions especially on climate finance matters saw intense wrangling between developed and developing countries. Rule 16 of the UNFCCC Rules of Procedure was applied on several finance items, which means if an item on the agenda of a session's consideration has not been completed at the session, it shall be included automatically in the agenda of the next session. COP-25 was, therefore, a

mixture of unresolved important issues to be worked on next year and some significant decisions that were finally adopted. The Madrid decision on Standing Committee on Finance (SCF), "*underscores the important contribution of the SCF in relation to the operational definitions of climate finance, and invites Parties to submit via the submission portal their views on the operational definitions of climate finance for consideration by the SCF in order to enhance its technical work on this matter in the context of preparing its 2020 Biennial Assessment and Overview of Climate Finance Flows*". This is important from the points of view of developing countries as this can be a premise to formulate a clear, and acceptable definition by the developing countries.

COP -26

3.35 As already explained in above paras, Rule 16 was applied at COP-25 on many agenda items, and these matters were supposed to be considered at COP-26 scheduled to be held in Glasgow in November, 2020 under the Presidency of United Kingdom. Due to Covid-19 pandemic, the Glasgow Conference had to be postponed to 2021. This has implications for climate change negotiations. An important finance issue is regarding climate finance goal of USD 100 billion annually by 2020. Hence, 2020 marked the year in which developed countries would attain the goal of mobilising jointly USD 100 billion. Developing countries had requested at COP-25 to mandate the SCF to compile a synthesis report on the attainment of the finance goal of USD 100 billion per year by 2020. This would have provided a valuable input into the process of setting a new long-term collective goal on finance by 2025. However, no decision was adopted at COP-25. It was also decided at Katowice to initiate the deliberations on setting a new collective quantified goal from a floor of

USD 100 billion per year. With COP-26 postponed, securing a synthesis report, or any other evidence-based work to inform the post-2025 goal, recedes even further into the future, as does the start date for meaningful negotiations on the new goal. With the postponement of COP-26, initiation of the deliberations and review of this goal could only take place in 2022 with the need to set the new collective goal by the latest 2024. The less time there is for in-depth negotiations, based on a technical assessment of needs of developing countries, the more likely it will be a politically determined number that would not speak to the actual needs of developing countries.

3.36 To sum-up, the Convention and the Paris Agreement explicitly recognizes the development imperatives of developing countries. The developing countries are required to take climate actions, taking into account their development priorities and circumstances. Given the vulnerabilities of developing countries to climate change, the adaptation requirements and financial assessments have to be viewed from the poverty alleviation and basic needs lens. However, it was only at COP -7 in 2001 a formal legal space for adaptation was accorded. Bali Action Plan adopted in 2007 established enhanced action on adaptation as a separate building block. At present, adaptation agenda is a matter of discussion under various bodies of the Convention. Paris Agreement brought the parity between mitigation and adaptation. It has several articles mentioning adaptation concerns, in addition to Article 7 which is dedicated to adaptation. A significant number of countries also included adaptation component in their NDCs. The Madrid decision in 2019 on adaptation calls on Parties to engage in adaptation planning processes and the implementation of actions. All these decisions underlined the aim to achieve a balance between adaptation and mitigation.

COP 1 in 1994	Decision 11/CP.1 addressed the concern relating to adaptation for the first time. It clearly mentioned that funding is to be provided by developed countries to developing countries.It listed different stages for adaptation
Year 2001	Third Assessment Report of the IPCC brought out clear evidence on "changing weather patterns and the need for adaptation actions along with mitigation"and provided the impetus for substantive work on adaptation
COP 7 in 2001	Included some critical elements on adaptation, thereby providing a formal legal space for discourse on adaptation.
COP 10 in 2004	The Buenos Aires programme of work on adaptation and response measures was adopted to develop methodologies to deal with adverse effects of climate change
COP 11 in 2005	A work program on impacts, vulnerability and adaptation was adopted to support developing countries understand and measure vulnerability and adaptation. However, it was still nothing concrete with finances surrounding
COP 13 in 2007	There were huge demands from developing countries to recognize adaptation as a separate building block to address climate change. Bali Action Plan established enhanced action on adaptation as a separate
COP 16 in 2010	Provided adaptation, the same status as mitigation. A dedicated climate fund, the GCF under the COP was established and it was decided that a significant share of the multilateral funding for adaptation would flow
COP 17 in 2011	An Adaptation Committee was established to promote implementation of enhanced action on adaptation. New and additional financing for adaptation was also emphasized in regard to GCF.
COP 21 in 2015	The Paris Agreement has several articles mentioning adaptation concerns, in addition to Article 7, which is dedicated to adaptation.
COP 24 in 2018	PAWP decision stated that apart from providing information on mitigation, Parties can also include adaptation, finance, technology transfer and capacity-building needs.
COP 25 in 2019	Madrid decision called on Parties to engage in adaptation planning processes and the implementation of actions

CHAPTER 4: AN ANALYSIS OF INDIA'S CLIMATE ADAPTATION RESPONSE

INDIA'S VULNERABILITIES AND EMERGING CLIMATE SCENARIO

4.1 India has a diverse geography with landscape varying from snow-capped mountain ranges to deserts, plains, hills, plateaus, coastal regions and islands. The diverse geography of India manifests varied climate regimes ranging from continental to coastal, from extremes of heat to extremes of cold, from extreme aridity and negligible rainfall to excessive humidity and torrential rainfall. India's climate is significantly influenced by the presence of the Himalayas and the Thar Desert as the former act as an orographic barrier to atmospheric circulation for both the summer monsoon and the winter westerlies and kept them confined within the subcontinent, thus playing a major role in causing rain. India's first National Communication to the UNFCCC (2004) states that *"India is subject to a wide range of climatic conditions ... The most important feature in the meteorology of the Indian subcontinent and, hence, its economy, is the Indian summer monsoon".* Indian climate variability is higher than the average global variability because of the monsoon unlike the continental types of climate of Europe.

Changing patterns of climate in India

4.2 Scientific reports presents evidence on observed increases in surface air temperatures over the past century. It ranges from temperature extremes resulting in cold waves during winter in the north and heat waves during the pre-monsoon period over most parts of India, wide seasonal variations in the temporal and spatial distribution of rainfall along with the predominant inter-annual and intra-seasonal modes of variability giving rise to extremes in seasonal anomalies resulting in large-

scale droughts and floods, to high intensity rainfall over a shorter period and prolonged breaks on a synoptic scale contributing to flash floods and vulnerable coastal districts based on physical exposure, social and economic growth aspects (Box 4.1).

4.3 Recent assessment reports by the IPCC show the South Asian region to be highly vulnerable to the impacts of climate change. India, being a large part of this region is thus also at risk. IPCC AR5 (2014) presents evidence for actual changes in climate patterns observed within this region. It also provides climate model results to analyze how climate patterns would change till 2100. There are looming threats of rising temperatures, extreme precipitation events and variable levels, etc. for the region. In fact, India's second biennial update report (Government of India, 2018) presented to the UNFCCC observes that "*…out of the 36 States and Union Territories in the country, 27 are disaster prone. 12 per cent land is prone to flood and river erosion; of the around 7,500 km coastline, 5,700 km is prone to cyclones; 68 per cent of the cultivable land is vulnerable to drought; hilly areas are at risk from landslides and avalanches; and 15 per cent of the landmass is prone to landslides*" . As per the Global Climate Risk Index, in 2018, India lost around USD 37 billion due to climate events such as cyclones battering the east coast and flooding and landslides in Kerala where about a quarter million people were displaced, 20,000 houses and 80 dams were destroyed.

Box 4.1: Climate- Trends and Recent variations

India's annual average temperature is increasing at a statistically significant rate of 0.61^{o}C per 100 years over the period of 1900-2019.

There is a significant increasing trend in the maximum temperature of 1^{o}C/100 years and a relatively lower significant increase in minimum temperatures at 0.22^{o}C/100 years.

The year 2018 is the sixth warmest year on record since 1901. 11 out of 15 warmest years were recorded during the recent past fifteen years (2005-2019).

Between 1989-2018 there have been significant changes in the frequency of dry days, rainy days (rainfall of amount 2.5 mm or more but less than 6.5 cm), and heavy rainfall (rainfall of amount 6.5 cm or more). The year 2019 witnessed more intense cyclones over the Arabian Sea. Out of 5 cyclones, there have been two very severe cyclonic storms, one extremely severe cyclonic storm, and one super cyclonic storm.

The frequency and duration of heat waves over north-west India and the east coast of India have increased. The duration of heat waves over central and north-west India has increased by about five days over the past 50 years.

Monitoring of winter precipitation and temperature in the Western Himalayas suggests a significant increase in total precipitation but a decrease in snowfall from 1991 to 2015.

Approximately 30 per cent of India’s population is dependent on the rich exploitable coastal and marine resources, and a number of urban and economic centres of strategic importance, including two of the four megacities (Mumbai and Chennai) of India are located along the coast. Currently, sea levels along the Indian coast are rising, on an average, at about 1.7 mm/year.

Source: Indian Meteorological Department & Ministry of Environment, Forest & Climate Change

Need for Adaptation

4.4 All these findings stated above points towards the need to take climate change concerns seriously, inculcate a sense of awareness of the likely impacts and nature of problems and enhance interaction between policy makers, scientists and other stakeholders in order to progress towards holistic solutions. Following such climate risk assessments, there have been number of research studies attempting to estimate the climate damage cost to the subcontinent. With an economy closely tied to its

natural resource base and climate-sensitive sectors such as agriculture, water and forestry, India faces a major threat due to projected changes in the climate.

4.5 Adaptation actions will have to be specific to national and local circumstances depending on the vulnerability of the different sectors of the economy and its implications. For example, an adaptation strategy for Saudi Arabia would be different to an adaptation strategy for India. The reason for this is that adaptation is of local importance: it has to be driven by the local needs and implemented locally (Mauskar, 2014). Climate adaptation has a key role to play in determining how such climate impacts manifest on the ground and how much damage they cause. For India, adaptation is inevitable and an imperative for the development process. A Government of India Report (June, 2020) observes that "*Climate change impacts are expected to worsen with the passage of time because of the momentum due to present carbon stock continuing to raise the temperature. Hence, India's adaptation needs will have to be intensified and so the adaptation costs will increase"*.

India's Constitutional and Development Imperatives

4.6 In the directive principles of Indian Constitution adopted in 1950, it was stated that material resources had to be distributed for the common good. *This embodies the concept of sustainable development* (Mauskar, J.M, 2014). Through its planned development process, India attempted to address issues of poverty and development. Domestic legislation drives sustainable development and poverty eradication objectives and actions. As is the case with international treaty on climate change, equity is the keystone of Indian Constitution and this imperative will hold true for India's domestic efforts. The multilateral treaty acknowledges and recognizes the development imperatives of developing countries, supports their right to develop

and their efforts to harmonize development with environment. Therefore for India, eradicating poverty and providing basic needs to all citizens is of utmost importance while meeting climate goals.

NATIONAL ADAPTATION PLANNING IN INDIA

4.7 As a country highly vulnerable to climate change, development planning in India has been marked with various climate friendly actions at different points of time. India, in its development process, formulated a large number of policies, which have the potential to enhance the adaptive capacities of people. India's major adaptation responses in a chronological order are depicted in Table 4.1.

Table 4. 1: India's Adaptation Planning and Policy Responses - Critical steps

National Environment Policy, 2006	Identifying key vulnerabilities of India to climate change and assess the need for adaptation to future climate change, and the scope for incorporating these in relevant programmes.
Expert Committee on Impacts of Climate Change set up (May 2007)	In pursuance to the announcement made in the Union Budget 2007-08, to study the impacts of anthropogenic climate change on India and to identify the measures to be taken in future in relation to addressing vulnerability to climate change impacts.
National level Coordination Committee constituted on 6th June 2007.	Prime Minister's Council on Climate Change to coordinate national action for assessment, adaptation and mitigation of climate change
National Action Plan on Climate Change (NAPCC), June 2008	Identified a number of measures that simultaneously advance the country's development and climate change related objectives through focused National Missions
State Action Plans on Climate Change, 2009	To ensure the convergence of State level priorities on climate objectives with NAPCC
12th Plan (2012–2017)	Climate change recognized explicitly in the Plan document
Economic Survey 2011-12, as a part of the annual Union Budget documents.	A full chapter on Climate Change has been included in the Economic Survey in 2011-2012 for the first time and continued since then.
Climate Change Action Programme, 2014.	To create and strengthen the scientific and analytical capacity for assessment of climate change, putting in place appropriate institutional framework for scientific and policy initiatives and implementation of climate change-related actions.
Nationally Determined Contribution, 2015.	India's post 2020 climate actions under the Paris Agreement.
National Adaptation Fund, 2015	To fund adaptation actions which are not otherwise covered under the ongoing schemes/ programs.
Union Budget, 2020-21	India's NDC will be executed in various sectors by the Departments/Ministries concerned through the normal budgeting process.
Sources: Author's Compilation	

Adaptation Relevant Initiatives to Climate Variability till 2008

4.8 India through its development planning process since the beginning was conscious of the emerging climate scenario, tried to mainstream these concerns in its relevant sector policies. Several efforts addressed some of these vulnerability concerns, although they were primarily driven by the objective of sustainable livelihoods and poverty alleviation. India also realized the strong need to replicate and augment these measures that present 'win-win' opportunities that not only address specific sustainable development objectives but also strengthen coping capacities and enable adaptation to climatic variability and change in the long run. This realization meant there were various initiatives taken in the climate sensitive sectors such as agriculture, water, coastal areas, forestry and addressing extreme climate events. The international climate treaty and its various decisions early on also played a great part in shaping the efforts of India. Major initiatives in the climate sensitive sectors till 2008 included: watershed management programme in rainfed areas, implementing drought proofing measures, developing drought-resistant varieties, promoting crop diversification, on-farm water-efficient technologies, farmer credit and loan system, promotion of water-harvesting measures including rejuvenation and revival of traditional water storage systems are high on the water conservation agenda, coastal regulation zones that indicate the sensitivities of coastal ecosystems and prevent their exploitation, introduction of the participatory forest management programme, and National Disaster Management Authority to coordinate actions. These initiatives were implemented in the form of a series of central sector and centrally sponsored schemes (CSS) under different Ministries/Departments aimed at achieving social and economic development but contained objectives and

targets that are decidedly adaptational (Ray, 2008). Budget allocation on these schemes had been substantial.

National Action Plan on Climate Change (NAPCC)

4.9 With the continuously emerging knowledge of climatic change and its impacts, greater policy attention to the domestic climate policy, in particular, on adaptation, has been accorded in the context of domestic policy framework. The result is that the adaptation policy and actions has grown, in particular, in the context of an integrated policy action. The first significant forward-moving step in adaptation preparation, planning and implementation in the country was the launch of NAPCC in June 2008. NAPCC identified eight core 'national missions' addressing critical concerns for the country in sectors like solar energy, energy efficiency, sustainable agriculture, sustainable habitat, water, forestry and enhancing knowledge regarding climate change. After the launch of the NAPCC, serious efforts have been made to dovetail national programmes of action to regional and local levels consistent with varying socio-economic and ecological conditions. Five national missions out of the eight under NAPCC focus on adaptation in key sectors. The State Action Plans on Climate Change (SAPCC) took their lead from National Mission documents. Many Indian States have prepared documents on the SAPCC. The common threads that bind these State Plans together are the principles of territorial approach to climate change, sub-national planning, building capacities for vulnerability assessment, and identifying investment opportunities based on State priorities. The major sectors for which adaptation strategies envisaged are agriculture, water, forests, coastal zone, and health. With the Paris Agreement coming into force post 2020, India has decided to revise the NAPCC in line with the NDCs to make it more comprehensive in terms

of priority areas. Largely, NAPCC has been successful in bringing the climate concerns at the centre of economic policy and development debate, while also providing a roadmap for climate actions. At COP-20 (2014), in Lima, Peru, at the High Level Segment, Indian Minister for Environment & Forests stated, *"I have always put our country's views at all available global platform that the world wants to discuss only about mitigation. But we want to discuss along with mitigation, more on adaptation. Because we are at the receiving end."*

NDC

4.10 The next milestone was the NDC under Paris Agreement, which outlined climate actions that India intended to take in the post 2020 period. Adaptation is a significant component spelt out in the NDC. India's NDC categorically stated among other things- "*To better adapt to climate change by enhancing investments in development programmes in sectors vulnerable to climate change*".

Recent Adaptation Initiatives

4.11 Climate Change Action Programme (CCAP) was launched in 2014 at a total cost of ₹ 2,900 million for five years to create and strengthen the scientific and analytical capacity for assessment of climate change in the country, putting in place appropriate institutional framework for scientific and policy initiatives and implementation of climate change-related actions. National Adaptation Fund was also set up in 2015 with an initial allocation of ₹ 3,500 million to combat the adaptation needs in key sectors. This Fund will assist national and state level activities to meet the cost of adaptation measures in areas that are particularly vulnerable to the adverse effects of climate change.

4.12 At the international level, India launched the Coalition for Disaster Resilient Infrastructure (CDRI) on the sidelines of the UN Secretary General's Climate Action Summit in September 2019. This international partnership of national governments, UN agencies, multilateral development banks, private sector, and knowledge institutions will promote the resilience of new and existing infrastructure systems to climate and disaster risks, thereby ensuring sustainable development. CDRI envisions enabling measurable reduction in infrastructure losses from disasters, including extreme climate events.

Estimates of India's Adaptation Costs

4.13 An overall assessment and quantification of finance requirements for adaptation for a country with so much diversity and demand is a difficult task given the rapid pace of changing technologies and innovation. India's NDC says, "Preliminary estimates indicate that India would need around USD 206 billion (at 2014-15 prices) between 2015 and 2030 for implementing adaptation actions in key areas like agriculture, forestry, fisheries, infrastructure, water resources and ecosystems. In addition to this, there will be additional investments required for strengthening resilience and disaster management. An Asian Development Bank Study (June, 2014) on assessing the costs of climate change adaptation in South Asia indicates that approximate adaptation cost for India in energy sector alone would roughly be about USD 7.7 billion in 2030s. Finding that much of resources is going to be a daunting challenge for the country, given the competing demands for various priorities. A lot of focus is required on the adaptation actions as it is primarily financed by the public resources and has negligible private sector participation. India's climate actions have so far been largely financed from domestic resources. Given the

vulnerabilities, adaptation is essential and India's economic future and prosperity is also dependent on her ability to adapt to the adverse impacts of climate change and to protect the developmental gains. It is only obvious that India's financial requirements for adaptation will increase.

Current and future adaptation cost estimates

4.14 Previous literature on India's adaptation requirement has estimated adaptation costs through multiple models and analysis methodologies. While there are studies that have looked at adaptation cost as the damage cost from changing climate patterns (ADB, 2014; World Bank, 2010; Markandya and Mishra, 2011; Development Alternatives, 2015), others have quantified it as the cost of climate resiliency programmes and adaptation responses (NAPCC, 2008; Ganguly and Panda, 2010). In fact, spanning from NAPCC document in 2008 to the NDC estimation, an expenditure range of 2.63 - 2.82 per cent of GDP has been said to be India's spent on adaptation to climate variability every year. Using the NAPCC and NDC documents as base, it can be stated that adaptation programmes broadly span eight areas - (1) crop improvement and research; (2) drought proofing and flood control; (3) forest conservation; (4) poverty alleviation and livelihoods preservation; (5) rural education and infrastructure; (6) health; (7) risk financing; and (8) disaster management.

4.15 A Government of India report (June 2020) stated that identifying the linkage between adaptation, SDGs and basic needs is central to the analysis on adaptation finance needs (Table 4.2). As a starting point of adaptation financing assessment, the programme costs of policies that contribute to the achievement of various SDGs was estimated and aggregated in the Report. For this, the mapping of central sector

schemes with the 17 goals in SDG India Index Baseline Report (NITI Aayog, 2018) was done in the report. In particular, every scheme in the mapped document was picked up to match with the expenditure budgets of the concerned Department/Ministry to finally pick up the total 'Actual 2017-18' spending from the Union Budget 2019-20. This was used for estimating an approximate of the actual domestic spending in 2017-18 on the SDG goals. For this analysis, however, full scheme amounts were included with no exclusions, in comparison to the expenditure budget analysis. The said analysis spanned over 46 ministries, to arrive at an estimate of ₹ 660372.03 crores (or 3.86 per cent of GDP). SDGs were selected based on their contribution to improving resilience. Since the SDG-CSS mapping was already done as part of Step 1, this step gave key policies/programmes that had a climate adaptation dimension. Tabulating the total expenditure on such projects, a figure of ₹ 326393.56 crores (or 1.9 per cent of GDP) was arrived at. In the Report, the financial needs for meeting the relevant SDGs as explained above have been taken to represent the need for financing to 'adapt to climate change.' After converting the data across all sectors to a common base year, the cumulative cost estimates for adaptation was summed up for the years of 2020 and 2030, and the sum was then discounted at the rate of 6 per cent to arrive at their present values in 2012. The cumulative costs in 2012 base prices was estimated to stand at approx. ₹ 28947.94 billion and ₹ 85.6 trillion in 2020 and 2030 respectively for adaptation.

Table 4.2: Broad contours of linkages between NDC commitments, SDGs and Basic Needs			
NDC sectors	**Climate impacts**	**SDGs**	**Basic Needs**
Water resources	Water scarcity	SDG 6 (Water availability to all)	Potable water
Agriculture,	Food systems	SDG 2 (end hunger, food security)	Food and nutrition
Health	Health Impacts	SDG 3 (ensure healthy lives)	Health services
Himalayan region	Water scarcity, impact on livability and quality of life	SDG11 (cities and human settlements safe and resilient)	Housing
Coastal regions		SDG 6 (Water availability to all)	Water supply and sanitation
Disaster management	Disasters	Part of SDG1 (No Poverty)	Safety from disasters, relief in case of disasters
Overarching variables	Education	SDG 4 (Quality Education) – affects overall adaptation capability	Education
	Income/poverty	SDG 1(No Poverty) – affects overall adaptation capability	Poverty alleviation
Source: Report of the Sub-Committee on assessing financial requirements for NDC, Government of India, June 2020			

GENDER DIMENSIONS AND ADAPTATION EFFORTS

4.16 Recognizing the role of women, the 2030 Agenda for Sustainable Development has a stand-alone Goal on gender equality and the empowerment of women and girls. Data has shown that women economic empowerment is highly correlated with poverty reduction, and a driver for economic growth. In many societies, gender inequalities have traditionally existed in the form of differences in property rights, lack of employment and education, as also limited cultural, social, and economic roles for women, and inadequate access to resources. Weaving these dimensions early into the fabric of global concerns is essential to the equitable implementation of the adaptation strategies. The UNFCCC has recognized the

importance of integrating gender considerations in climate change adaptation and mitigation (Box 4.2).

Box 4.2: Gender and the international climate policy negotiations

Internationally, it is increasingly being acknowledged that while climate change affects everyone, it tends to exacerbate the existing inequalities in a society. This causes the impact of climate change to be felt differently by different sections depending upon their position in the social hierarchy. Specifically, women tend to be impacted more severely due to their socio-economic status and lack of access to information.

The Paris Agreement integrated gender into the areas: Preamble, Adaptation, and Capacity-building. In 2017, the gender action plan of UNFCCC was finalized. The aim of the Gender Action Plan is to ensure that women can influence climate change decisions, and that women and men are represented equally in all aspects of UNFCCC, as a way to increase its effectiveness. The Plan has priority areas ranging from increasing knowledge and capacities of women to pursuing the equal and meaningful participation of women in national delegations, including from grassroots organizations, local and indigenous peoples.

According to the UNFCCC Secretariat's informal report (2020), overall, gender integration into national climate action is progressing as countries realize the climate and social benefits of taking different needs and perspectives into account in mitigation and adaptation to climate change.

Source: UNFCCC

India and gender-responsive climate actions

4.17 According to India Development Report of the World Bank, India ranks 120th among 131 countries for female labour force participation. When half of the population is not provided with equal access to education, skill development and thereby not participating fully in the labour market, economy also cannot achieve its fullest potential. *In 2012, only 27 percent of adult Indian women had a job, or were actively looking for one, compared to 79 percent of men. In fact, almost 20 million women had dropped out of the workforce between 2005 and 2012. This is equivalent to the entire population of Srilanka* (Speech by Ms. Annette Dixon, World Bank South Asia Vice President, Economic Times Woman's Forum Mumbai- March 2018).

4.18 Recurring incidence of erratic rainfall, increasing possibilities of extreme events can result in loss of agricultural produce. Women are exposed to harvest loss, which are often their sole sources of food and income. Climate change may, thus, result in a consequent shrinkage of work opportunities, and would inflict a blow to the socio-economic edifice of the rural womenfolk. Second, climate variability usually impacts sectors that are traditionally associated with women, such as paddy cultivation, cotton and tea plantations, and fishing. The effects of climate change on gender inequality also have long-term ramifications for future gender relations. In many rural communities, women carry the entire responsibility of collecting water for household use, nursing children during sickness, cooking, and providing proper nutrition to the household. With climate change bringing about a possible decline in availability of foodgrains and increase in vector borne diseases, the stress on women in particular multiplies. Therefore, a multiplicity of factors lead to a situation in which women find the share of the burden for adaptation falls disproportionately on them, despite they having low ability to adapt. An analysis of the type of fuel used for cooking by households in India would show that a majority of households still rely on firewood as fuel for cooking. The time spent on collecting firewood is substantial. So, better access to affordable and modern energy services provides an opportunity to divert the time spent on fetching firewood to more productive and paid work. Thus it becomes imperative in devising appropriate adaptation measures, with special focus on women.

4.19 Based on the recognition that national budgets benefit women and men differently, and may even reinforce patriarchal social norms and biases, India formally adopted Gender Responsive Budgeting (GRB) in 2005-06. GRB does not

merely involve earmarking of funds for women; it is an exercise that scrutinises the budget through a gender lens. The Gender Budget Statement comprises two parts: Part A reflects women-specific schemes with 100 per cent allocation for women, and Part B is constituted by pro-women schemes wherein at least 30 per cent of allocation is for women.

4.20 Women can play important roles in the process of adaptation and mitigation. They are the ones who has a major role in decisions at the household levels on the types of *chula* used for cooking, as also deciding the sanitation norms. They need to be readily involved in the micro-level strategy action to combat climate change. Programmes like *Pradhan Mantri Ujjwala Yojana* (PMUY) and Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) significantly influence the socio-economic aspects of women empowerment and initiates women involvement in decision making processes. Energy access and clean fuels constitute fundamental aspects of the well-being of women. PMUY launched in 2016, aims to safeguard the health of women and children by providing families that fall Below the Poverty Line (BPL) with clean cooking fuel - liquefied petroleum gas (LPG), to avoid cooking in smoke-filled kitchens using biomass. As an attempt to empower the female members of these households, especially in rural areas, the LPG connections are issued in their names. As on October 2020, a total of 80.33 million connections have been given under the scheme. The small and marginal holders, particularly women, require significant income support, which is provided through the MGNREGA scheme. In last five years, under the *Swatch Bharat* (Clean India Mission) a record more than 110 million toilets were constructed benefiting the poor and women of the country the most. The gender sensitive features of these acts have ensured significant work participation from women thus enabling gender sensitization.

4.21 The above steps are decidedly in the right direction. Yet it is clear that as a society, India is not realizing the full potential of its women capabilities. Women are deprived of their opportunities at an individual level. At the same time, as a society also, there is a cost in terms of economic value foregone collectively. According to Mckinsey Global Institute (November 2015), "*India's economy would have the highest relative boost among all regions of the world if its women participated in paid work in the market economy on a similar basis to men, erasing the current gaps in labour-force participation rates, hours worked, and representation within each sector".*

4.22 Going forward, road map for implementing NDC has to clearly spell out and assess how gender features in national-level plans. Awareness programme on women related issues should be publicized and should be mainstreamed from margins to mainstreams in all developmental programmes of the government.

CHANGING CIRCUMSTANCES IN THE CONTEXT OF COVID-19 PANDEMIC AND THE PRESSING NEED FOR ADAPTATION FINANCE

4.23 Dictionary.com has declared 'pandemic' as its Word of the Year 2020 as the Covid-19 pandemic rapidly spread across the world. World Health Organization called Covid-19 a public health emergency of international concern and declared it a pandemic on 11th March 2020. The lockdowns as an initial response strategy resulted in significant economic consequences in terms of drastic cut in economic activities and job losses and there was a disproportionate impact on the most disadvantaged people in society. Simultaneously, the need for keeping social distancing, controls on gatherings, social functions etc. adversely affected various sectors of the economy and addressing many pressing concerns of the time such as climate change became a

challenge. COP-26 scheduled to be held in November 2020 had to be postponed by one year due to the pandemic.

4.24 In the longer term, the socio-economic consequences of the pandemic can be expected to have lasting implications for global adaptation processes well after the pandemic has passed (UNEP Adaptation Gap report, 2020). Most prominently, the severe negative impacts of the pandemic on the global economy are likely to reduce the availability of adaptation finance in the long term (Quevedo, Peters and Cao 2020). Pandemic induced pressure on public finances is expected to be disproportionately felt in developing countries, where governments are likely to face being simultaneously hit by reductions in domestic tax revenues and external finance (OECD, 2020a). There is literature available pointing towards implementing the economic stimulus packages well while simultaneously addressing climate concerns of building enhanced climate resilience and reducing emissions. However, this is easier said than done. In reality, the economic uncertainties are expected to remain high and public financing availability for climate is likely to take a hit and the sum-total gap in financing to implement the NDC post-Covid may well be orders of magnitude much higher. According to International Monetary Fund (IMF) 'World Uncertainty Index' the uncertainty around the coronavirus is much higher than the past outbreaks. The priorities would now focus aggressively on poverty eradication, job creation, building up a strong and resilient health infrastructure and so on. The positive story is that there would be sharper focus on strengthening adaptation actions and solutions in the case of food systems, health care, water and sanitation and disaster management. The current estimates of India's climate adaptation are likely to go for upward revision if the incidence of weather extremes experienced in recent years is any indication. Further, Covid-19 pandemic has led to severe stress on the

health care system in the country and also had a major impact on the economic activities and thereby contraction in the economy. In the middle of these global health and economic crises also, the climate crisis continued in 2020. India experienced extreme weather disasters during the Covid-19 pandemic such as Super cyclone 'AMPHAN' over the Bay of Bengal and 'NISARGA' over the Arabian Sea. This indicates undertaking immediate measures to deal with the threats of climate change.

4.25 The Covid-19 pandemic has drastically altered the context for international climate finance. International public climate finance will have a crucial role to play for a climate-resilient growth, for which a more robust climate finance architecture and an ambitious new collective goal on climate finance must be set. Post pandemic, more than ever, the implementation of climate commitments must reflect equity and the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances.

INDIA'S ADAPTATION STRATEGIES AND HER CHALLENGES

4.26 As can be seen from the above analysis, India's adaptation actions have been strengthened over the years and it is no longer in the margins. It is a theme which receives significant attention including in the Budget documents. Going forward, road map for implementing NDC has to clearly spell out and assess how adaptation figures in national-level plans and how it would be mainstreamed into the development process.

4.27 One important step is to consider climate markers in the budget documents, similar to the spirit shown in gender budgeting. It has now become important to identify, link, collate and monitor the various channels of climate finance across

different sectors. India's climate adaptation actions would be supported largely by domestic climate finance through budgetary allocations spreading across different Ministries/ Departments. However, there is no set methodology to track the financial flows. These markers, as explained below, would act as an enabling framework to: establish climate financing trends (flows towards mitigation / adaptation / resilience/cross cutting); input to decision making and budgetary allocations towards regions / activities / industries / social cause; aggregation of all climate related activities; and provide the reference framework for other stakeholders such as financial institutions and development agencies for assessing/aligning their climate expenditure in India. The first step here is to define clear boundaries for the expenditure. This sets the contours for all the expenditure which can qualify to be accounted for climate expenditure. The second step is to do the climate impact review analysis of each scheme/project with the lens of alignment to the definition of climate action, the components being alignment to mitigation actions, adaptation actions and cross cutting actions. The third step is to further refine and identify the climate relevance in terms of high, medium and marginal relevance.

4.28 As a growing economy striving to achieve a better standard of living for its citizens, the developmental needs will also increase. Substantial efforts are still required to strengthen food security, provide adequate housing, access to energy, and ensure full access to basic social services . There are still significant challenges in the provision of safe drinking water, sanitation and drainage and solid waste management. The Union Budget 2020-21 stated that *India would implement its NDC climate actions in various sectors through the normal budgetary process with the participatory support from all the stakeholders including State Governments*.

However, in the midst of pandemic also, climate-induced events and disasters are growing. Hence, India's adaptation needs will have to be intensified and so the adaptation costs will increase. This, in turn, implies that India has to go beyond its budgetary resources to take adaptation actions effectively. A transition to a climate resilient economy requires new, additional and climate-specific financial resources.

4.29 A worrisome proposition from the recent discussions at the international level is regarding the issue of climate disclosure. Recent Reports (FSB, 2017) highlighted the need for greater information and awareness that needs to be created for increasing climate resilient investments and mainstreaming adaptation in critical policy areas. One cannot have a different point of view regarding the need for greater information and awareness that needs to be created for increasing climate resilient investments. At the same time, it is the developing countries, who are going to be most adversely affected by climate change impacts, a problem which they never created. Therefore, it is important to consider that there is a risk from incorporation of climate risks as a major factor in financial risk assessments which may actually lead to decline in the investment flows to these countries. It is essential that development of approaches to climate risk disclosure and incorporation of these risks in decision making should not lead to decrease in investment in developing countries. Further, climate information for adaptation projects is often qualitative in nature and thus its impacts are not easily measurable in quantitative terms. As the scope, need and reporting intensity of disclosures may vary across sectors and across countries, the disclosure framework should also take into account countries' plans and policies and level of development.

4.30 To sum up, the diverse geography of India manifests varied climate regimes ranging from continental to coastal, from extremes of heat to extremes of cold, from

extreme aridity and negligible rainfall to excessive humidity and torrential rainfall. Climate adaptation has a key role to play in determining how such climate impacts manifest on the ground and how much damage they cause. India through its development planning process tried to mainstream these concerns in its relevant sector policies through several schemes, although they were primarily driven by the objective of poverty alleviation, but contained objectives that are decidedly adaptational.

4.31 With the continuously emerging knowledge of climatic change and its impacts, greater policy attention to adaptation has been accorded in domestic policy framework. The first significant step in adaptation was the launch of NAPCC in 2008 with various focused missions across various sectors. The next milestone was the NDC in 2015. India has been implementing various adaptation relevant programmes with gender responsiveness. India formally adopted GRB in 2005-06, an exercise that scrutinizes the budget through a gender lens. Programmes like PMUY and MGNREGA significantly influenced the socio-economic aspects of women empowerment.

4.32 India's adaptation actions are no longer in the margins. It is a theme which receives significant attention including in the Budget documents. Going forward, road map for implementing NDC has to clearly spell out and assess how adaptation figures in national-level plans. One important step is to consider climate markers in the budget documents. It has now become extremely important to identify, link, collate and monitor the various channels of climate finance across different sectors and activities.

4.33 As a growing economy striving to achieve a better standard of living for its citizens, the developmental needs will also increase. Substantial efforts are still required to strengthen food security, provide adequate housing, access to energy, and ensure full access to basic social services. Union Budget 2020-21 stated that NDC implementation would be done as a part of the budgetary process. However, climate change impacts are expected to worsen, which implies that India has to go beyond its budgetary resources to take adaptation actions effectively. A transition to a climate resilient economy requires new, additional and climate-specific financial resources. International climate finance will have a crucial role to play for a climate-resilient growth, for which a more robust global climate finance architecture and an ambitious new collective goal on climate finance must be set. Post pandemic, more than ever, the implementation of climate commitments must reflect equity and the principle of common but differentiated responsibilities in the light of different national circumstances.

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CHAPTER 5: CONTOURS/ELEMENTS OF ADAPTATION FINANCE - THE JOURNEY SO FAR

5.1 As mitigation and adaptation are two climate response strategies, an operational definition of climate finance is an essential pre-requisite for defining what constitutes adaptation finance. Hence, this Chapter explores, first, the climate finance definition complexities and then brings the specific challenges of adaptation finance in particular.

DEFINITION AND ITS CONTOURS

5.2 A climate finance definition as well as a common accounting methodology is a crucial element for transparency, credibility, assessment and evaluation of climate finance, including the provision, mobilization and flows as well as the effectiveness of the policies and instruments of operating entities of the financial mechanism of the Convention. The definition and accounting of climate finance has been at the middle of discussions. Achieving transparency with respect to defining and accounting of climate finance will be a major milestone in the UNFCCC.

5.3 Since the Rio Conference in 1992, the UNFCCC has gone through a remarkable journey. The process has adopted related legal instruments including the Paris Agreement and large number of Decisions of the COP. Over the years, climate finance has emerged as a key pillar in enabling climate actions. This can be measured from the fact that a quantified number in terms of climate finance was promised by developed countries in Copenhagen in 2009 to developing countries in terms of a flow of USD 100 billion a year by 2020. Article 9 of the Paris Agreement stipulates that *developed countries shall provide financial resources to assist developing*

countries with respect to both mitigation and adaptation in continuation of their existing obligations under the Convention. However, climate finance remained as a contentious issue in the climate discourse because there is no agreed operational definition of climate finance under the Convention, though Article 4.3 states elements and principles of climate finance in terms of new and additional financial resources and taking into account the need for adequacy and predictability in the flow of funds. Despite the fact that Article 4 seem to define climate finance, there is, however, continuing disagreement about what exactly counts as climate finance. This confusion allows different nations and institutions interpreting climate finance in their respective context. Hence, the first and over-riding priority should be to work towards a common operational understanding and definition as to what constitutes climate finance and to work towards a set of standards for the measurable, reportable and verifiable (MRV) of public climate finance.

5.4 In the absence of an operational definition, there has been discrepancies in the climate finance reporting- what has been provided and what has been received. There have been various claims about the progress towards Copenhagen annual climate finance goal of USD 100 billion per year. In the run up to Paris negotiations in 2015, the OECD published a report claiming that developed countries provided USD 62 billion in climate finance in 2014 (OECD and CPI, 2015). The Indian Ministry of Finance countered their claims and stated that only USD 2.2 billion could be regarded as credible new and additional climate support from rich to poor countries (Government of India, 2015). The Paper raised serious questions about the credibility and accuracy of the figures so reported. Another report (UNFCCC, 2018)states that the total climate specific finance flows (self-reported figures) from Annex II Parties in

2016, amounts to around USD 38 billion which is less than 40 per cent of the USD 100 billion target of climate finance. In the run up to Katowice Conference in December, 2018, Indian Ministry of Finance had released another discussion paper on "3 Essential 'S's of Climate Finance- Scope, Scale and Speed – A Reflection" (Government of India, 2018). It questioned the various numbers reported, methodologies used and found inconsistencies in the definitions of climate change finance used in various reports with the Convention provisions.

5.5 The provision, mobilization and flows of climate finance and transparency are crucial elements in Paris Agreement. Yet, as explained above, various actors use different working definitions and approaches and harmonization of reporting approaches by data producers and aggregators is still lacking. The transparency, accuracy, completeness, comparability and consistency principles, particularly the principles of transparency and consistency referred to in Article 9.7 of the Paris Agreement, highlight the importance of the continued harmonization of reporting approaches and operational definitions of climate finance over time, including sectoral classifications. Such harmonization is important for generating comparable data to ensure the transparency of support provided and received by relevant Parties to provide a full overview of aggregate financial support provided and to inform the global stocktake under Article 14 (UNFCCC 2018). The objective here is to facilitate the provision of clarity on support, improved reporting and transparency over time. The principles are transparency, accuracy, completeness, consistency and comparability. The crucial point to note here is that under the transparency principles, the reporting or tabulation of support provided, cannot differ in the end substantially from the reporting or tabulation of support received. In other words, the two have to

reconcile or get very close to each other. Overall, still the UNFCCC guidelines leave extreme discretion to developed countries regarding climate finance accounting (Government of India, 2018). Each developed country can decide what it counts as climate finance and why it is climate finance and whether it can be considered as "New and Additional" (Weikmans & Roberts, 2019).

5.6 Post Paris, the negotiations under the PAWP presented an opportunity to list out step by step what should be counted as climate finance. In fact, achieving transparency with respect to defining and accounting climate finance would have been a major milestone in the UNFCCC. However, the outcome on this front so far is sub-optimal. In essence, the coverage of climate finance was ambiguous, the quantum was insufficient and pace of delivery of finance was slow (Ray & Mauskar, 2019).

5.7 Katowice Conference did come out with rules governing climate finance– the identification of ex ante information to be provided by developed countries in accordance with Article 9.5 of the Paris Agreement; ex post information on financial support provided and mobilized under Article 9.7 of the Paris Agreement respectively. Finance decision stressed on greater granularity in reporting- type of sectors for which support is provided, type of financial instruments etc. However, it still provided amble amount of discretion with the wordings such as "as available", "an indication" with regard to protected levels of financing and of new and additional resources respectively. In effect, the Katowice outcome was short of ensuring clarity in international climate finance flows through a definition of climate finance. A year later, Madrid decision at COP-25 (2019) on finance items were adopted after highly

contested claims between developed and developing countries. One of the key issues revolved around the 'common' definition of climate finance. Contrary to agreeing on the need for a 'common' definition of climate finance, the decision invited Parties to submit their views on the operational definitions of climate finance for consideration in order to enhance its technical work in the context of preparing its 2020 Biennial Assessment and Overview of Climate Finance Flows.

5.8 Given the complexities involved, it is no surprise that the definition and accounting of climate finance has been at the centre of multilateral climate discourse. A breakthrough in defining clearly what constitutes climate finance and thereby bringing transparency will be significant achievement of the multilateral process .

NEED FOR COMMON UNDERSTANDING OF ADAPTATION FINANCE

5.9 As stated in earlier sections, the starting point of building a definition must be laid down in relevant articles of the Convention. If one was to go by these Articles (especially 4.3) for defining and setting the boundary of climate finance, then the new and additional grant equivalent of public flows from developed countries to developing countries should qualify as climate finance. In terms of eligibility criteria, definitions outside the Convention do not emphasize the flows to be new, additional, and incremental and flowing from developed to developing countries. There are particular institutional objectives that drive the approach that Multilateral Development Banks (MDBs) and other financial institutions are taking to track climate finance, including meeting targets to increase climate related spending. A common taxonomy will be needed to tag eligible climate projects/activities to facilitate tracking of such types of flows in the future.

Defining Adaptation Finance

5.10 As climate finance is required for taking two response strategies to address climate change, i.e., mitigation and adaptation, one can argue that the portion of climate finance flowed for adaptation actions are termed as adaptation finance. It is often commonly referred as finances that funds adaptation actions as adaptation finance. Though one may argue in these simplistic terms, it is an extremely complex issue. As explained in the previous sections, climate finance remained as a complex issue in terms of what it constitutes. Without a definition of climate finance, it is nearly impossible to define adaptation finance. In other words, defining climate finance is a necessary condition to get a sense of what is adaptation finance. Further, adaptation finance is a much more complex issue. *Adaptation has tended to lag behind mitigation efforts both in research and in the climate negotiations. In part this is because adaptation and development specialists, governments, NGOs, and international agencies have found it difficult to clearly define and identify precisely what constitutes adaptation, how to track its implementation and effectiveness, and how to distinguish it from effective development* (Burton et al., 2002; Arnell, 2009; Doria et al., 2009). A contributing reason is that adaptation has no common reference metrics in the same way that tons of GHGs or radiative forcing values are for mitigation methods. Estimating adaptation finance, in particular, are difficult due to the fact that it is context-specific and incremental. "*Adaptation finance can be understood in terms of investments in activities that address current and expected effects of climate change. These are often part of mainstream development efforts, and can therefore be difficult to distinguish from wider investments for development. Indeed, mainstreaming understanding of climate change risks and opportunities to*

respond into core development efforts is an important dimension of adaptation" (UNFCCC Biennial Assessment Report 2016).

5.11 The timescale and frequency over which the multiple impacts of climate change will materialize further complicate the creation of common impact metrics for adaptation. It will be difficult, for example, to measure the beneficiaries of an intervention to reduce the impact of a slow-onset event that will occur over many years, likely after the intervention has ended. Similarly, building resilience to 1-in-100-year extreme weather events can prove problematic to verify beneficiaries in the high likelihood the event happens outside the time span of the intervention. *Conventional development interventions, including those supporting sustainable livelihoods or social protection, can strengthen resilience and adaptive capacity, making it difficult to distinguish between good development and adaptation activities* (Levine, Ludi and Jones, 2011; Fankhauser and Burton, 2011; Jones et al., 2012). Efforts to improve the understanding of adaptation impact are often based on the resilience-building lens. However, tracking resilience is challenging and methodologies are diverse. They range from composite indices based on objective indicators (Tanner et al., 2015) to subjective measures of risk perception (Jones and Tanner, 2015). Without agreed international definitions on what it means to be more resilient, and consideration of the context in which it is taking place (including for example, various institutional settings) it remains difficult to compare results and impacts between multilateral climate funds. *The perspectives for measuring and comparing adaptation outputs also differ between actors; thus, as work on adaptation metrics continues, it will be important to capture results that are important to a diversity of actors* (Christiansen, Martinez and Naswa, 2018). The working definitions of adaptation finance by various institutions given in Box 5.1.

Box 5.1: Working definitions of adaptation finance by various institutions

OECD-DAC: "An activity that intends to reduce the vulnerability of human or natural systems to the current and expected impacts of climate change, including climate variability, by maintaining or increasing resilience, through increased ability to adapt to, or absorb, climate change stresses, shocks and variability and/ or by helping reduce exposure to them. This encompasses a range of activities from information and knowledge generation, to capacity development, planning and the implementation of climate change adaptation actions".

MDBs: "Financial resources associated with only those components or elements/ proportions of projects that directly contribute to or promote adaptation, with the aim of lowering the current and expected risks or vulnerabilities posed by climate change. – Has been based on MDB joint methodology for tracking adaption finance that follows a context- and location-specific, conservative and granular approach. This approach is not intended to capture the value of the entire investment that may increase resilience as a consequence of specific activities within the project".

IDFC: "Uses the definition provided in appendix B of the Green Finance Mapping IDFC Report, which takes the MDBs–IDFC Common Principles for Climate Change Adaptation Finance Tracking into account. An activity will be classified as related to climate change adaptation if it addresses current and expected effects of climate change, where such effects are material for the context of those activities".

CPI: "Adaptation finance is defined as resources directed at activities aimed at reducing the vulnerability of human or natural systems to the impacts of climate change and climate related risks, by maintaining or increasing adaptive capacity and resilience".

Source: Technical Report of the 2018 Biennial Assessment and Overview of Climate Finance, Standing Committee on Finance, UNFCCC

Typology of Climate Adaptation Actions

5.12 Based on an analysis of projects financed under UNFCCC Funds, B. Biagini et al. (2014) categorises 158 adaptation activities into ten typologies (Table 5.1).

Table 5.1: Typology of Climate Adaptation Action		
Adaptation category	**Description**	**Examples of actions in category**
Capacity Building	Developing human resources, institutions, and communities, equipping them with the capability to adapt	Training/workshops for knowledge/ skills development, public outreach and education, identification of best practices, training materials
Management and Planning	Incorporating understanding of climate science, impacts, vulnerability and risk into planning and management	Developing an adaptation plan, livelihood diversification, drought planning, coastal planning, changing natural resource management
Practice and Behavior	Revisions or expansion of practices and on the ground behavior that are directly related to building resilience	Soil/land management techniques; climate-resilient crops, livestock practices, post-harvest storage, rainwater collection, integrated pest management
Policy	The creation of new policies or revisions of policies or regulations to allow flexibility to adapt to changing climate	Mainstreaming adaptation into development and land-use policies, improvement of water resource governance, ensuring compliance with existing regulations
Information	Systems for communicating climate information to help build resilience towards climate impacts (other than for early warning systems)	Decision support tools, communication tools, data acquisition efforts, digital databases, remote communication technologies
Physical infrastructure	Any new or improved hard physical infrastructure aimed at providing direct or indirect protection from climate hazards	Climate-resilient buildings, reservoirs for water storage, irrigation systems, canal infrastructure, sea walls
Warning or observing systems	Implementation of new or enhanced tools and technologies for communicating weather and climate risks,monitoring changes	Developing, testing and deploying monitoring systems, upgrade weather or hydromet services
Green Infrastructure	Any new or improved soft, natural infrastructure aimed at providing protection from climate hazards	Re-vegetation, afforestation, woodland management, increased landscape cover
Financing	New financing or insurance strategies to prepare for future climate disturbances	Insurance schemes, microfinance, contingency funds for disasters
Technology	Develop or expand climate-resilient technologies	Technologies to improve water use or access, solar energy capacity, biogas, water purification etc.
Source: B. Biagini et al. (2014)		

What constitutes climate finance?

5.13 As explained above, climate finance has been defined differently by various actors. Given the relevance of the topic, a range of actors in private and public sector including multilateral climate funds, Government and aid agencies are funding climate actions through various channels forming a complex network of finance flows. Some working definitions of climate finance by different institutions are given in Box 5.2 below:

Box 5.2: Working definitions of climate finance by different institutions

Biennial Assessment and Overview of Climate Finance Flows Report (2014),UNFCCC Standing Committee on Finance: "Climate finance aims at reducing emissions, and enhancing sinks, of GHG and aims at reducing vulnerability, and maintaining and increasing the resilience, of human and ecological systems to negative climate change impacts".

Working Group 3, AR5, IPCC (2014): The term 'climate finance' is applied both to the financial resources devoted to addressing climate change globally and to financial flows to developing countries to assist them in addressing climate change.

Climate Funds Update, (2019): Climate finance refers to the financial resources mobilised to fund actions that mitigate and adapt to the impacts of climate change, including public climate finance commitments by developed countries under the UNFCCC.

UNEP Bilateral Finance Institutions Climate Change Working Group: "finance flowing to developing countries, including support for mitigation, adaptation, 'climate' policy and capacity building" (UNEP BFI CCWG).

World Bank, OECD and other MDBs: "capital flows specifically targeted at low-carbon and climate-resilient development with direct or indirect greenhouse gas mitigation or adaptation objectives or outcomes."

Source: Technical Report of the 2018 Biennial Assessment and Overview of Climate Finance, Standing Committee on Finance, UNFCCC

5.14 An attempt to defining climate finance under the Convention needs a set of elements/criteria that a particular amount of fund being mobilized must fulfill, for it to be termed as climate finance. The multilateral process must give out a very

plausible picture of what all parameters should be considered as climate finance. While counting climate finance, only the climate relevant portion of the total expenditure needs to be counted. There has to be various steps in the methodologies to be followed while calculating the climate expenditures such as a methodology boundary setting the contours for all the expenditure which can qualify to be accounted for climate expenditure; a methodology identifying clear guidelines for certain expenditure; analyses each scheme/ project with the lens of alignment to the definition of climate action; alignment to mitigation, alignment to adaptation, alignment to cross-cutting; then calculate the climate relevance by assigning the weightage in terms of high, medium, marginal and no relevance. So, no data from any reports which doesn't confirm to an agreed methodology of accounting climate finance should be considered. Hence, the present study proposes that a more detailed definition to identify what "constitutes" climate finance should answer at least the following important elements:

i. Purpose of the funds: adaptation/mitigation/development
ii. Types of funds mobilized: Loans/Grants
iii. Sources of these funds: Public/Private
iv. Providers and recipients of such funds: Developed /developing countries/Private money/MDBs/Climate funds
v. Identifying elements establishing newness and additionality
vi. Should be acknowledged by both receiver and provider

Capturing Climate Finance Provided

5.15 'Climate finance provided' shall be captured at three levels to ensure transparency and consistency of information across all Parties:

a. Climate finance committed/pledged/promised by developed country Parties through a relevant funding channel
b. Climate finance approved for developing country Parties by the relevant funding channel
c. Climate finance disbursed for projects and programmes in developing country Parties by the relevant funding channel

Modalities for Accounting

5.16 The modalities for 'information on support for developing country parties provided' need to be accounted based on the principle of 'concessionality'. Given the vast nature and type of financing available globally including full grants, concessional loans, secured loans, export credits etc., a common methodology for accounting of finance support that qualify as climate finance should be made. COP needs to adopt guidelines on what kinds of support will qualify as 'climate change finance/support'. The support should qualify as climate finance when it is provided for programmes that are 'overwhelmingly for climate actions' in developing countries, and this shall be based on the principle of 'type of activity' rather than the ' purpose of activity' as adopted in OECD DAC reporting system and the guidelines of the Rio markers for identifying climate-related activities. Only the grant-equivalent element of any claimed climate change financing should be counted, and not the gross face-value of all loans, guarantees, export credits and other elements. Adding the gross face value of loans, guarantees and private financing is thus creative accounting, not climate finance (as agreed under the Convention).

5.17 The next step is we need to know who the recipients are. It would be prudent that there is 'book of accounts' that is transparently available to both contributors and recipients of climate change finance, as is standard in all financial transactions. The other important step is the need for robust verification. There is a need for a reliable set-up that can assure that the definitions and methodologies agreed are being substantially complied in the submission of reports by developed countries. The crucial point to note here is that under the transparency principles, the reporting or tabulation of support provided, cannot differ in the end substantially from the reporting or tabulation of support received. In other words, the two have to reconcile or get very close to each other. There are several implications that follow: (i) reporting of both to coincide has to follow common definitions, which must be easily verifiable, to the satisfaction and build trust among both Parties that provide support and that receive such support. (ii) This cannot be achieved by the usual standards of one-sided DAC 'aid-reporting'.

5.18 Flows of support can take a variety of shapes and forms---from grants to loans, under varying rates of interest, and terms and conditions, guarantees, equity and public support to private flows---they must also be commonly expressed under a single comparable and measurable concept or number, such as the commonly used concept of grant-equivalency. The way to compare flows of support across instruments and purposes across countries and sources must be a grounded bottom-up approach at the recipient country level: a **'**common book of entry or accounts' anytime that support is received, agreed and used by a country, can be converted to a comparable number and reconciled with the sources of such support flows from sources. Such systems of reporting should be transparently available to both contributors and recipients. Such a common "Sources and Uses' format is a standard

reporting device under all accounting, auditing and transparency principles that are followed world-wide. If two countries involved provide and accept a particular flow as climate finance based on their mutual agreement and understanding, it could then be counted as climate finance provided. This system will leave the responsibility of tagging a particular fund as climate finance between the two transacting countries in case of a bilateral flow. It is only fair to say that countries at least understand and assess where the finances is coming from, where is it flowing and in what form. Further, recognizing that globally public resources are scarce, it is even more imperative that a 'credible', 'transparent', 'measurable' and 'understandable' climate finance reporting system is in place.

Key Steps for Comprehensive Reporting System of Climate Finance

5.19 There could be five key stages to a comprehensive reporting system for consistent, transparent, measurable accounting and thereby overall transparency and effectiveness in order to deliver ambitious climate actions. Such a system can be developed as a part of the UNFCCC process and can be recorded into different forms as:

Public Finance

- Reporting on Public/Official Support
- Reporting on Public Interventions to mobilise private finance
- Other Official Flows (market loans, technology transfer)

Private Finance

- Mobilised Private Finance
- Other Private Flows (trade)

Templates for accounting

5.20 Following templates for accounting climate finance, therefore, has been prepared keeping in view the above noted factors and considerations.

Template 1: Public/official flows

UNFCCC	Climate Finance Support: Individual Project Data Form: Public/Official Bilateral Support			
1. Reporting Country	2. Recipient Country		3. Recipient Organisation Data entry Verified by Designated Recipient country.	
Disbursed Support				
4	Type of Support *Grant* *Concessional Loan*	Total Amount	Grant element Grant eq value	5. Name of Provider 6. Type of Provider 7. Date of Disbursement
	8. Amount type		9. Unit (USD)	
10	Activity Type (Mitig/Adap/both)	11. Sector	12. Name of project	
13	Project start date	14. Project duration	15. Project Impact	16. Co-financing Details on co-financing such as entity, amount
Committed Support				
17	Type of Support *Grant* *Concessional Loan*	Total Amount	Grant element	18. Committing Entity 19. Type of Entity 20. Date of Commitment
	21. Amount type		22. Unit (USD)	
23	Activity Type (Mitig/Adap/both)	24. Sector		
25	Project start date	26. Project duration	27. Project Impact	28. Co-financing Details on co-financing such as entity, amount
29	Support listed in ODA/OOF	Yes	No	*31. Element of Additionality*

30	Support listed in other sources	Yes	No

Template 2: Mobilized Finance

UNFCCC	Climate Finance Support: Individual Project Data			
	Form: Mobilised finance			
1. Reporting Country	2. Recipient Country	3. Recipient Organisation	Data Verified by Recipient country	
Public Intervention that supported mobilisation of finance				
5	Type of Support	Total Amount	Grant element*	6. Name of Provider
	Guarantee *Equity*			7. Type of Provider
				8. Date of Disbursement
	9. Amount type		10. Unit (USD)	
11	Activity Type (Mitig/Adap/both)	12. Sector	13. Name of project	
12	Project start date	13. Project duration	14. Project Impact	15. Co-financing
				Details on co-financing such as entity, amount
Mobilised finance				
16	Amount of co-	type of	Amount	17. Co-financing Entity

	financing	instrument		
	Total additional finance raised			18. Type of Entity
19		20. Source	21. Instrument	
22	Actual Mobilisation	***Amt***	23. Expected mobilisation	***Amt***
24	Amount type		25. Unit (USD)	

5.21 The important elements of climate finance, various levels of capturing climate finance, modalities for accounting, key steps for comprehensive reporting system of climate finance have been explained above. Including these provisions in reporting through a UNFCCC process can go a long way in bringing the transparency, clarity and comparability required in climate finance landscape and thereby clearly understand the size of adaptation finance.

HOW ADAPTATION FINANCE IS DIFFERENT FROM DEVELOPMENT AID?

5.22 The UNFCCC is a science based Convention and historical responsibilities are integral to it. Provision of climate finance to developing countries is one among the important obligations. Precisely for this reason, climate finance is not discretionary. The terms “donor” and “aid” have not been used even once in the UNFCCC or its Paris Agreement because it is in line with the “responsibility paradigm” as distinct from the “aid paradigm” of multilateral financial institutions or

Official Development Assistance. It is well recognized that developing countries are particularly vulnerable to climate change impacts. Even natural climatic shocks cause setbacks to economic and social development in developing countries. There is a lack of infrastructure, financial means and access to public services. Their poverty and lack of capacities limits their responses.

5.23 The UNFCCC Compact requires adaptation to be addressed through provision of new and additional financial resources and needed technology to developing countries by developed countries. In climate negotiations, it is encouraging to see that there has been acknowledgement and recognition of the fact that adaptation requires resources of significant order of magnitude. However, when it comes to allocation of resources and measuring, reporting and verifying adaptation finance, crucial debate and disagreement often arises regarding projects/activities/intervention as to whether it was a development project or a climate change project.

5.24 As a Fund dedicated solely to the climate change, it is important that GCF should finance high relevance climate projects. The Governing Instrument of GCF in paragraph 2 states *"In the context of sustainable development, the Fund will promote the paradigm shift towards low-emission and climate-resilient development pathways by providing support to developing countries to limit or reduce their greenhouse gas emissions and to adapt to the impacts of climate change, taking into account the needs of those developing countries particularly vulnerable to the adverse effects of climate change".* The adaptation goal articulated in Article 7 of the Paris Agreement has a befitting reflection in Article 9 of the Paris Agreement which has articulated finance section. The implication is that it envisages an increase in fund flow to adaptation in future from the current levels. Hence, climate funds' investment criteria

should factor in high impact potential adaptation projects to ensure efficient and effective projects/programmes which are scalable. In other words, high quality adaptation projects which make a meaningful impact on the ground in terms of climate benefits are crucial in this scheme of things. The investment criteria of the GCF with regard to the adaptation projects encompasses that project proposals should describe the expected change in loss of lives, value of physical assets, livelihoods, and/or environmental or social losses due to the impact of extreme climate-related disasters and climate change in the geographical area of the GCF intervention. Proposals should refer to the number of direct and indirect beneficiaries of the project, taking into account the needs of developing countries. The toolkit of GCF also seeks to explain and specify the climate impact potential- say adaptation impact in the case of adaptation programme /projects. It also states: *"in addition to the core indicator, accredited entities are encouraged to provide specific values for other indicators as they see fit"*. Further, along with quantitative indicators, accredited entities may wish to supplement with more qualitative information such as climate resilient infrastructure.

5.25 This in fact provides the room and space to develop projects/programmes while according specific values for both quantitative and qualitative indicators as deemed fit. In addition, the accredited entities can provide indicators for sustainable development benefits and a narrative of co-benefits. The qualitative information as well as the co-benefits is especially important in the context of adaptation actions, where these are in general strongly aligned with development actions and poverty reduction potential and also a large share of domestic public resources are allocated.

5.26 A tool which assesses the relative importance of climate benefits (i.e. adaptation), compared with other sustainable development (SD) benefits can help us to state what should be qualified as adaptation projects/programmes. This relative importance can be termed as the climate relevance (or CC per cent) of the programme. The CC per cent is defined as (B-A)/B where B is the benefits with CC and A is the benefits without CC. When an activity in the form of project or programmatic intervention has to be taken in the key identified vulnerable sectors from climate change perspective, the climate relevance of the actions needs to be examined. This approach of identifying high climate relevance adaptation activities and with multiple sustainable development co-benefits lead to maximizing the efficiency of investments. In this context, the reporting of co-benefits need be accounted and should be encouraged by the financial mechanism for adequately exploring the synergies as well as possibilities to integrate adaptation to development. This can act as a vehicle for mobilizing resources not only from international public finance but also significant co-financing from domestic public resources, which goes a long way in the case of adaptation where much of the burden has to be absorbed by public resources.

5.27 A project proposal can clearly describe the problem induced by climate change and how the project is designed to address the issue in clear terms. For this, it is important to create a baseline scenario which shows the situation in which no project is implemented and another scenario which shows the impacts when the project is implemented without the climate change component. In case of projects where separation of climate change component and the development component is easy, this would require clear distinction between the climate change component and the development component. If they are not easily separable, it is important to

explain in detail the logic by which the development component is necessary for success of the project with regard to the climate change related goals of the project. Given the above definitions, it is also important to show both the processes proposed to be undertaken and the avoided damages or benefits accrued from the adaptation component of any project compared to a baseline projection when there is no such component in the project.

5.28 In total, the analysis above highlighted the complexities around the operational definition of climate finance and brought the specific challenges of adaptation finance in particular. Despite the fact that Article 4 of the Convention seem to define climate finance there is, however, continuing disagreement about what exactly counts as climate finance. This confusion allows different nations and institutions interpreting climate finance in their respective context. Hence, the first and over-riding priority should be to work towards a common operational understanding and definition as to what constitutes climate finance and to work towards a set of standards for the MRV of public climate finance. It is a crucial element for transparency, credibility, assessment and evaluation of climate finance, including the provision, mobilization and flows as well as the effectiveness of the policies and instruments of operating entities of the financial mechanism of the Convention.

5.29 Climate finance also remained as a complex issue in terms of what it constitutes. Without a definition of climate finance, it is nearly impossible to define adaptation finance. Further, adaptation finance is a much more complex issue, given the nature of the interventions as it is difficult to clearly define and identify precisely what constitutes adaptation. One reason is that adaptation has no common reference

metrics in the same way for mitigation and methods for estimating adaptation finance, in particular, are difficult due to the fact that it is context-specific and incremental.

5.30 Overall. this chapter explained the important elements of climate finance, various levels of capturing climate finance, modalities for accounting, key steps for comprehensive reporting system of climate finance and suggested a template for comprehensive accounting, which can capture the purpose of activity and type of activity separately including adaptation. Including these provisions in reporting through a UNFCCC process can go a long way in bringing the transparency, clarity and comparability required in climate finance landscape and thereby clearly understand the size of adaptation finance.

5.31 Another point analysed in this chapter is the debate on development v/s adaptation. When an activity in the form of project or programmatic intervention has to be taken in the key identified vulnerable sectors from climate change perspective, the climate relevance of the actions needs to be examined. A tool which assesses the relative importance of climate adaptation benefits compared with other sustainable development benefits can help to state what should be qualified as adaptation projects/programmes. In case of projects where separation of climate change component and the development component is easy, this would require clear distinction between the climate and the development component. If they are not easily separable, it is important to explain in detail the logic by which the development component is necessary for success of the project with regard to the climate change related goals of the project.

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CHAPTER 6: CURRENT LANDSCAPE OF ADAPTATION FINANCING FLOWS

6.1 This Chapter highlights, first, the institutional arrangements for adaptation financing under the multilateral climate change regime, second, presents an analysis of the climate finance goal of USD 100 billion by 2020 based on the available data, and third, examines the projected funding needs and the present landscape of adaptation financing, source and destination countries. Overall,it provides an overview of the current state of play of adaptation finance flows.

INSTITUTIONAL ARRANGEMENTS FOR ADAPTATION FINANCING

6.2 The global climate finance architecture and governance is a complex one. There are a number of channels for climate finance flows: multilateral climate funds, funds established by developed countries and climate finance through bilateral development assistance institutions. Many developing countries including India also set up national funds. The various instruments have also been used such as grants and concessional loans, to guarantees and private equity.

6.3 Specifically with respect to financing, Article 4.3 (provision of new and additional financial resources); Article 4.4 (assistance to meet the costs of adaptation); and Article 4.5 (promotion, facilitation and financing of the transfer of, or access to, environmentally sound technologies); Article 4.7, (balance of commitments between developed and developing country Parties) Article 4.8 (funding for response measures especially in vulnerable developing countries); and Article 4.9 (on funding for LDCs) of the Convention detail legally binding commitments of developed countries.The same balance of commitments between developed and developing country Parties is captured under section 1b(ii) of the Bali Action Plan (UNFCCC,

2007) which states, "*Nationally appropriate mitigation actions by developing country Parties in the context of sustainable development, supported and enabled by technology, financing and capacity-building, in a measurable, reportable and verifiable manner*". Article 9 of the Paris Agreement also captures the balance of commitments between developed and developing countries.

The financial mechanism of the Convention

6.4 The contribution of countries to climate change, and their capacity to prevent and cope with its consequences, varies enormously. The Convention, therefore, foresee financial assistance from Parties with more resources to those less endowed and more vulnerable. To facilitate this, the Convention in its Article 11 established a financial mechanism, which is accountable to the COP, and decides on its climate change policies, programme priorities and eligibility criteria for funding. The financial mechanism of the UNFCCC also serves the Paris Agreement. Funding for climate change activities is also available through bilateral, regional and multilateral channels. At COP-16 (2010), Parties decided to establish the SCF to assist the COP in exercising its functions in relation to the Financial Mechanism of the Convention.

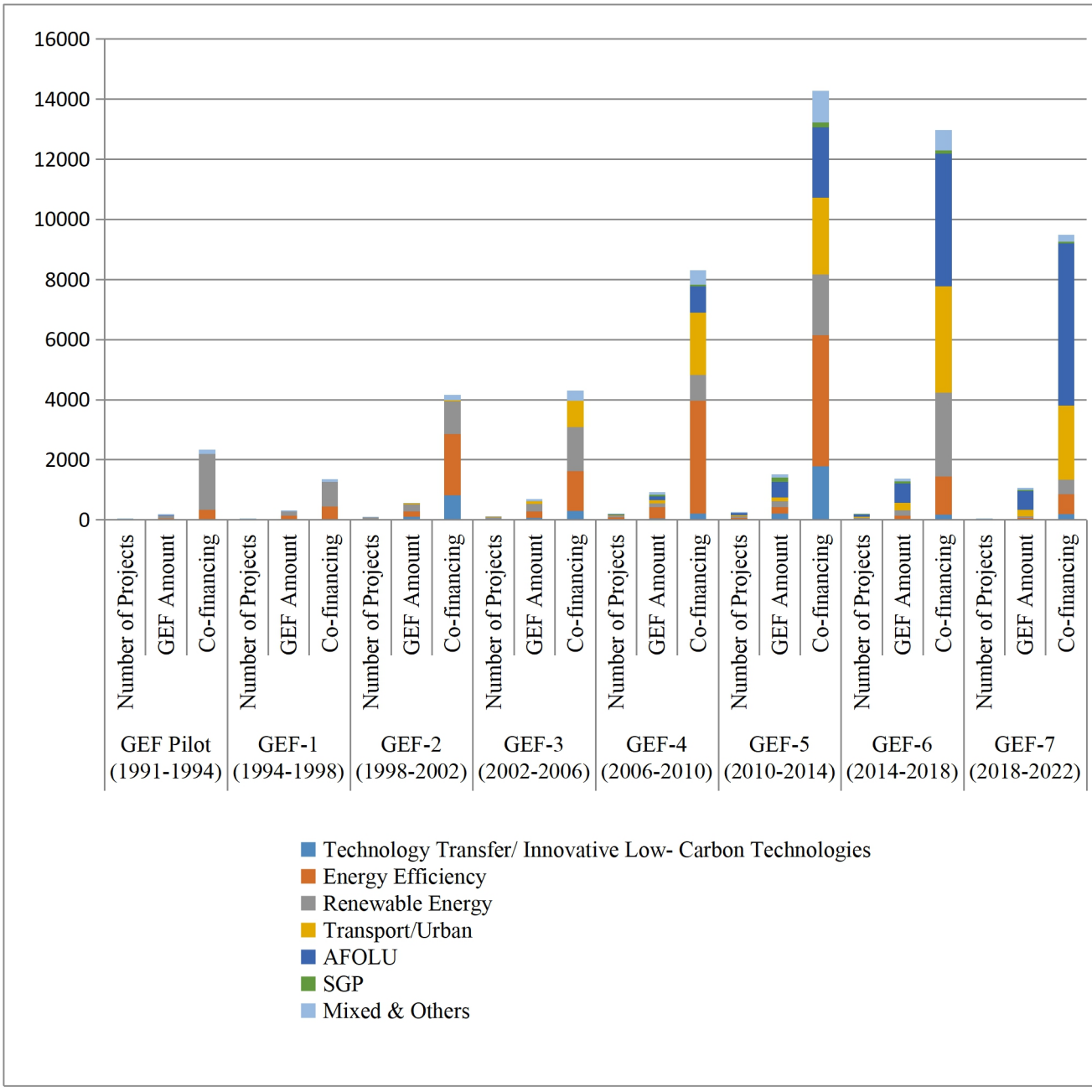
Multilateral Climate Change Funds

6.5 The COP has established several climate funds, which are detailed below:

(i) Global Environment Facility (GEF) has served as an operating entity of the financial mechanism since the Convention's entry into force in 1994. The relationship between the COP to the UNFCCC and the GEF Council was agreed in a memorandum of understanding (MOU) contained in decisions 12 of COP-2 and COP-3. The Paris Agreement and related COP decisions affirmed the role and

contributions of the GEF to address climate change. Financial contributions to GEF are done by 40 countries, which are replenished every four years. Since its establishment in 1991, the GEF has been funding projects with mitigation objectives in developing countries and countries with economies in transition (CEIT). As of June 30, 2020, the GEF has supported 1,008 projects on mitigation with more than USD 6,689.7 million GEF funding, including Project Preparation Grants (PPGs) and Agency Fees, in over 166 countries (Figure 6. 1). The GEF funding leveraged USD 57,193.7 million from a variety of sources, including GEF Agencies, national and local governments, multilateral and bilateral agencies, the private sector, and civil society organizations (GEF Report to COP 26, 2020). In the context of adaptation, GEF experience has not been encouraging because the GEF, in accordance with its Governing Instrument, found it difficult to finance adaptation in general, and can only conduct pilot projects for capacity building for adaptation. The GEF also practices what it calls “interface” financing, in which it claims that “synergies” and “co-benefits” are obtained. One of the key concerns as regards the GEF revolved around the ‘inadequacy of resources’ with dwindling amounts in every replenishment cycle. Concerned about the situation in the wake of emerging science on climate change impacts, developing countries started asking for major reforms in the financial mechanism.

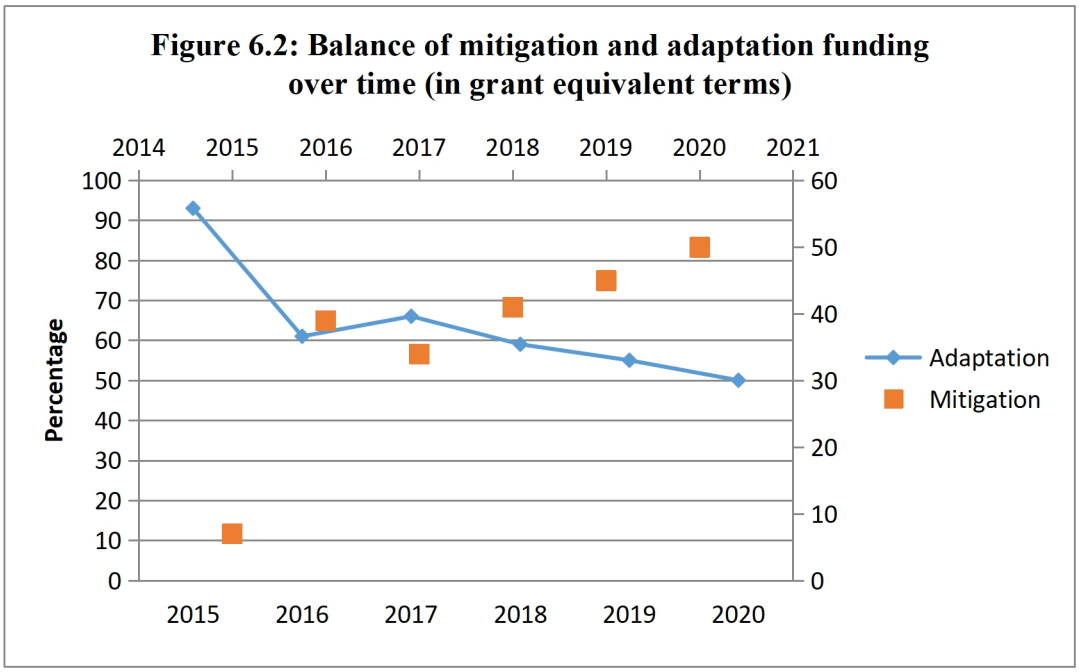
Figure 6.1: GEF Projects on Climate Change Mitigation by Phase (in USD Million)



Source: GEF Report (2020) to COP 26

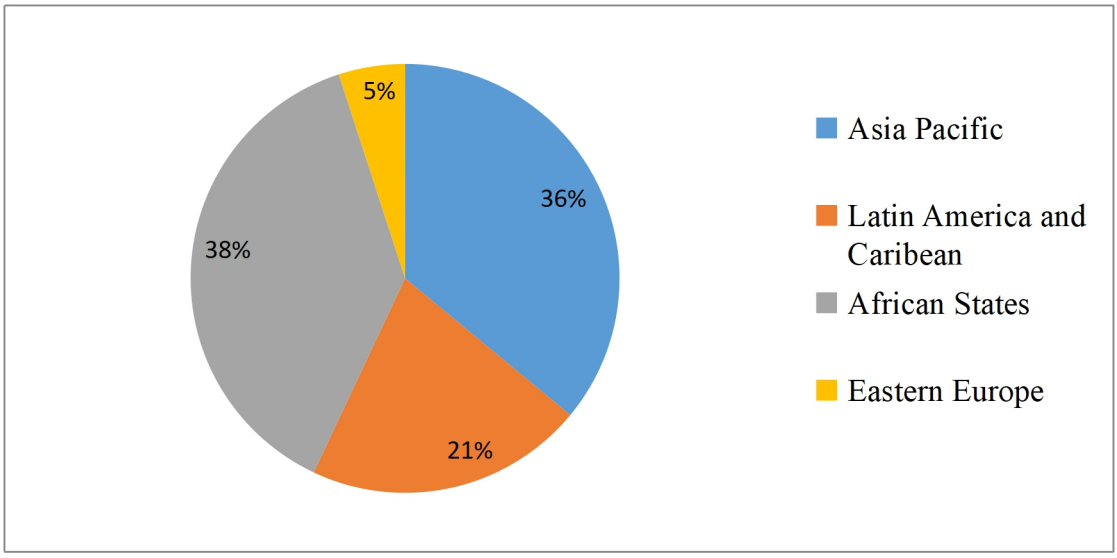
(ii) Green Climate Fund (GCF): At COP-17 held in Durban, South Africa (2011), the COP established the GCF under the Convention to support projects,

programmes, policies and other activities in developing nations. The important distinction of the GCF is that it has an independent legal status and personality and nationally designated authorities have a paramount role to play. The GCF is the largest dedicated climate fund. As of 31 December, 2020, GCF collected pledges worth USD 10.3 billion in the initial resource mobilisation launched in 2014. However, total amount confirmed was USD 8.31 billion only. For the First Replenishment period of GCF (2020-23), as of 31 December, 2020, total amount announced with credits was USD 9.99 billion and amount confirmed was USD 9.53 billion. At the end of 2020, the GCF portfolio was precisely balanced between mitigation and adaptation (Figure 6.2). As of 31 December 2020, GCF funding has been allocated to projects and programmes in 117 countries. In terms of regional distribution of GCF funding, the largest portion is allocated to the Africa region, followed by the Asia-Pacific region, Latin America and the Caribbean and Eastern Europe (Figure 6.3). The portfolio utilizes a wide range of financial instruments: grants and loans, results-based payments, equity, and guarantees (Figure 6.4). In the recently held Climate Adaptation Summit in January, 2021, GCF announced that it is committing half of its USD 7 billion portfolio to adaptation action, with more than two thirds of adaptation funding reaching the most vulnerable countries.



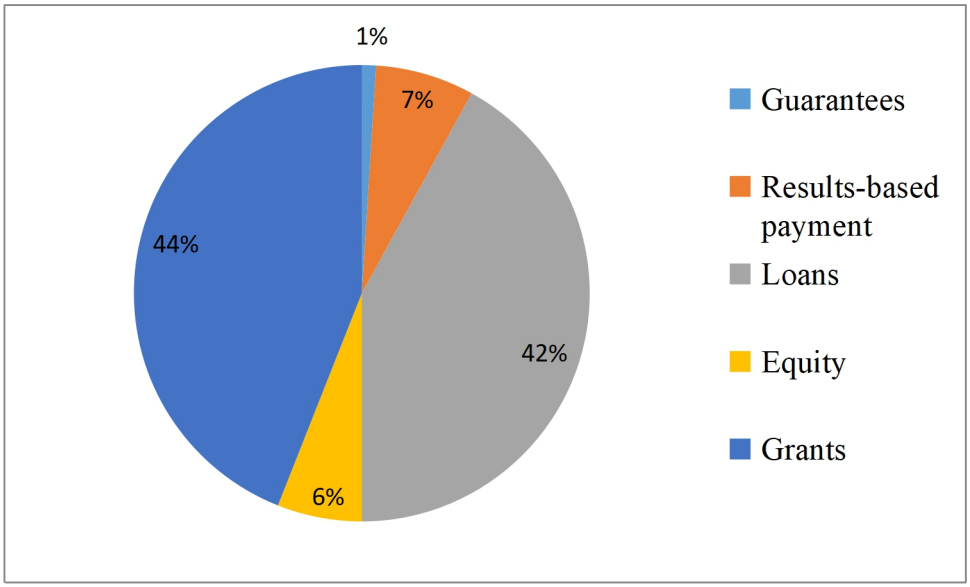
Source: GCF, 2021

Figure 6. 3: Regional Distribution of GCF Funding



Source: GCF, 2021

Figure 6.4: GCF Funding By Financial Instruments



Source: GCF, 2021

(iii) Special Climate Change Fund (SCCF): The SCCF was established to finance activities, programs, and measures relating to climate change. This Fund is managed by GEF. While the SCCF has four financing windows, climate adaptation was prioritized, in accordance with decision 5 of COP-9. The SCCF has supported 87 projects with USD 355 million in grants and benefiting 7 million people (GEF, 2020).

(iv) Least Developed Countries Fund (LDCF): The LDCF was established to support the special needs of LDCs, as enshrined in Article 4 of the UNFCCC and the LDC work programme. The LDCF has financed 305 projects with approximately USD 1.6 billion in grants. The projects also identify opportunities to mitigate impacts of Covid-19 to contribute toward green recovery (GEF 2021).

(v) Adaptation Fund: This Fund was established under the Kyoto Protocol to finance concrete adaptation projects and programmes in developing country Parties to the Protocol. The Adaptation Fund is financed from the 2 per cent share of proceeds on the CDM project activities and other sources of funding. The Adaptation Fund is supervised and managed by the Adaptation Fund Board. The most important characteristics of this Fund is that Parties have direct access. With over USD 778 million allocated to 114 concrete, localized adaptation projects, the Adaptation Fund gives developing countries full ownership of adaptation projects, from planning through implementation, while ensuring monitoring and transparency at every step.

CLIMATE FINANCE GOAL OF USD 100 BILLION BY 2020

6.6 At Copenhagen (2009), developed countries committed to jointly mobilize USD 100 billion of climate finance a year by 2020. COP-21 in Paris (2015), in its decision text on the adoption of Paris Agreement, in para 54, mentions: "*Also decides that, in accordance with Article 9, paragraph 3, of the Agreement, developed countries intend to continue their existing collective mobilization goal through 2025 in the context of meaningful mitigation actions and transparency on implementation; prior to 2025 the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement shall set a new collective quantified goal from a floor of USD 100 billion per year, taking into account the needs and priorities of developing countries"*. It is important to know the actual flows under 2020 climate finance goal and how far or near we are in comparison to the goal. At the same time, it is important for the process to be conducted within the UNFCCC for setting the new collective quantified goal, informed by lessons of the USD 100 bn goal.

6.7 The OECD has estimated that USD 78.9 bn of climate finance was mobilized in 2018. However, these estimates met with criticism indicating that OECD's approach was skewed in favour of the developed world. Critics argued that the mobilization of USD 100 billion per year goal is nowhere near fulfillment. A clearer picture was given by Oxfam regarding the assessment of USD 100 billion which mentioned of the estimated USD 59.5 billion in public climate finance reported by developed countries (annual average), climate-specific net assistance may be just USD 19–22.5 billion and the net financial value of climate finance to developing countries – the grant equivalent – may be less than half of what is reported by developed countries. The net result is that there are serious concerns raised in the methodologies of accounting especially the definitional requirements of "new and additional" and grant equivalent elements. Self-reporting and estimating the climate finance cannot be evaluated in hands of one group without considering the developing countries. The reported estimates must be supported and assessed by developing countries with due diligence. This would enhance the trust among all stakeholders. One step to address this issue is to have a Synthesis Report on USD 100 billion by 2020 goal compiled by the SCF. The Report will be a valuable input in the climate finance process and would serve as important learning for the process of setting a new collective goal prior to 2025.

6.8 Recent independent analysis of scenarios for 2019 and 2020 suggests that the impact of Covid-19 have made it increasingly challenging for meeting the USD 100 billion target in 2020. The postponement of COP-26 in 2020 due to the pandemic meant less time for in-depth negotiations. Whilst the final figures for 2020 will not be known until 2022, developed countries need to demonstrate now how they will scale up climate finance to meet their commitments. It again

reiterates that the issues of transparency, credibility, adequacy, predictability are important in terms of a new goal on climate finance and in this context an agreed climate finance definition and accounting methodology is critical.

GLOBAL LANDSCAPE OF ADAPTATION FINANCE

Climate Finance by Annex II Parties to developing countries

6.9 The 2018 Biennial Assessment Report of the SCF provides an overview of current climate finance flows. The Report outlines that total climate specific finance flows from Annex II Parties in 2016, amounts to around USD 38 billion which is less than 40 percent of the USD 100 billion target of climate finance. The report also mentions aggregate flows for mitigation remains greater than support for adaptation across all sources. Adaptation received only 29 percent and 25 percent of the bilateral fund flows and multilateral fund flows respectively during 2015-16. It also stated that during the same period, only 9 percent of adaptation finance flowing through MDBs was grant based. The report confirms the level of climate finance is considerably below than what is required.

6.10 SCF also produced a technical Report on Biennial Assessment and Overview of Climate Finance Flows (2018) based on Biennial Reports submitted by Annex II Parties to the UNFCCC. Table 6.1 provides the climate-specific finance and core general funding provided by Annex II Parties to developing countries. Climate specific funding has more than doubled during the period 2011-16. But the speed and scale have been insufficient and inadequate. The Technical Report itself admits that there are a number of data gaps and hence the need for improvements in generating high quality data.

Table 6.1: Climate finance by Annex II Parties to developing countries (USD billion)

	Bilateral, regional and other channels				Total climate-specific finance (bilateral. reg. &other)	Multilateral				Total climate-specific finance (multilateral)	Total climate-specific finance[a]	Core general[b]	Grand total
	Mitigation	*Adaptation*	*Cross-*	*Other*		*Mitigation*	*Adaptation*	*Cross-cutting*	*Other*				
2011	8.79	2.64	2.00	0.65	14.08	1.33	0.44	0.96	0.17	2.90	16.98	11.78	28.76
2012	9.91	2.00	1.79	0.68	14.38	0.99	0.44	1.22	0.05	2.70	17.08	11.83	28.91
2013	15.17	4.25	3.02	0.71	23.15	0.58	0.43	1.2	0.06	2.27	25.42	15.11	40.53
2014	17.08	3.55	2.5	0.74	23.87	0.45	0.29	1.88	0.12	2.74	26.61	16.63	43.24
2015	19.98	4.16	2.44	3.34	29.92	0.38	0.19	1.84	0.19	3.06[a]	32.98	12.42	45.40
2016	24.06	5.15	3.27	1.08	33.56	0.21	0.41	1.78	0.19	3.96[a]	37.52	11.91	49.43

Source: UNFCCC Standing Committee on Finance Technical Report on Biennial Assessment and Overview of Climate Finance Flows (2018).

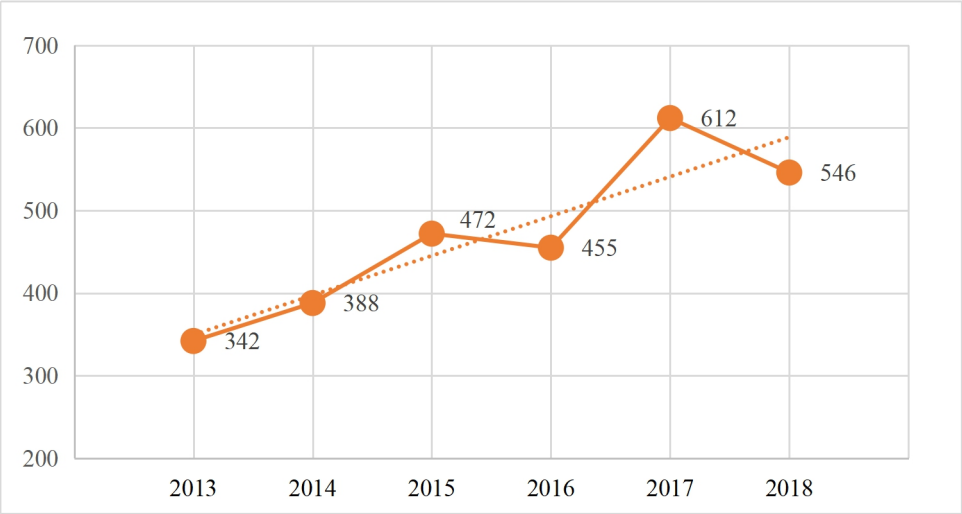
Note: Data accessed on 12 June 2018. *a*- Sum of mitigation, adaptation, cross-cutting and other climate finance provided via bilateral, multilateral, regional and other channels. Information related to the United States is drawn from preliminary data provided. Of the USD 3.06 billion in 2015, USD 0.46 billion is from the data provided by the United States. Of the USD 3.96 billion in 2016, USD 1.37 billion is from the data provided by the United States. However, the total US climate-specific multilateral contributions are not shown in the table breakdowns. *b*-Support provided to multilateral and bilateral institutions that Parties do not identify as climate-specific.

Climate Policy Initiative Report (CPI, 2019)

6.11 As per the CPI Report (2019), climate finance flows reached USD 546 billion, driven particularly by renewable energy capacity additions and increased public commitments to land use and energy efficiency (Figure 6.5). Average annual public climate finance totaled USD 253 billion in 2017/2018, representing 44 per cent of total commitments (Figure 6.6). Domestic, bilateral, and multilateral development finance institutions account for the majority of public finance. Private finance, which

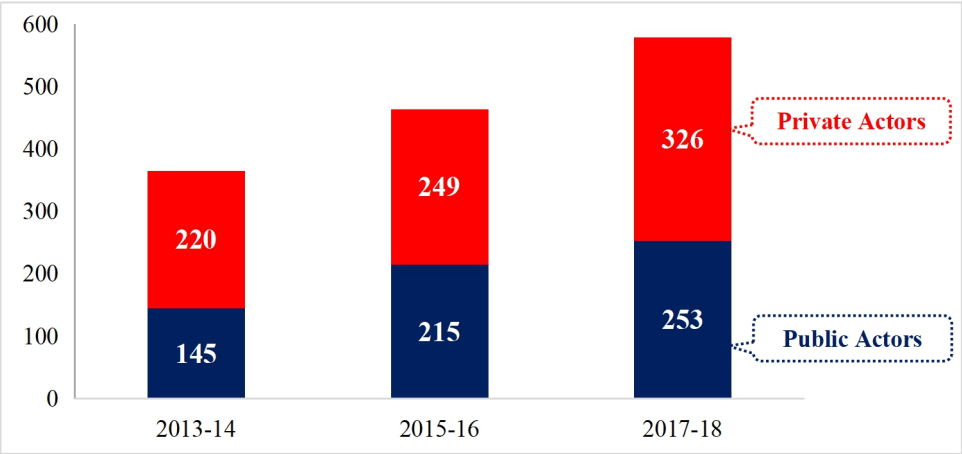
reached USD 326 billion on average annually in 2017/2018, account for the majority of climate finance at around 56 per cent.

Figure 6.5: Climate Finance Flows



Source: Climate Policy Initiative Report (2019)

Figure 6.6: Annual Climate Flows to Sectors



Source: Climate Policy Initiative Report (2019)

Projected Funding Needs

6.12 Meeting the objectives of the Convention and its Paris Agreement will necessarily require large volume of resources. There are a number of estimates about the funding needs to take climate actions. The numbers vary from one

organization/institution to another. However, all these estimates agree and converge on one point. The funding needs are enormous and making a case for trillions of dollars. What it also points out that there are still significant gaps in financing climate actions. Major estimates by various organizations/institutions are detailed below:

- *Bloomberg's New Energy Outlook 2020* s*tates that reducing emissions well below two degrees under clean electricity and green hydrogen pathway (100,000TWh of power generation by 2050) requires between USD 78 trillion and USD 130 trillion of new investment between now and 2050.*
- *The OECD estimates that around USD 103 trillion of cumulative investment between 2016 and 2030 would be required for the IEA 66% 2°C scenario, or 10% more than in a scenario where no further action is taken to mitigate climate change.* The major shift of energy supply investments towards low-emission alternatives and significant scaling-up of demand-side investments for energy efficiency assumed by the scenario would require 29 per cent more investment in the energy sector alone (IEA, 2017). Annual investment needs in transport, water and sanitation, telecommunications and energy supply and demand would be around USD 6.9 trillion over the next 15 years, versus USD 6.3 trillion a year with no further action.
- The issue is more complex when one looks at adaptation finance. *A United Nations Environment Programme (UNEP, January 2021) Report* released recently on adaptation to climate change impacts, estimates that annual adaptation costs in developing countries currently is USD 70 billion. The Report further states that adaptation costs in developing countries are "*expected to reach USD 140-300 billion in 2030 and USD 280-500 billion in 2050*".

- As per the *Independent Expert Group on Climate Finance published in UN* "Delivering on the USD 100 Billion Climate Finance Commitment and Transforming Climate Finance" stated that "*the collective goal must be to more than surpass the USD 100 billion per year target in 2021 and to scale up international public finance in the period thereafter to accelerate the drive to net zero carbon and climate-resilient growth"*. The needs of developing countries are even greater in the aftermath of Covid-19 as the economic consequences have been particularly severe for EMDEs, drastically reducing both their domestic and international financing options.
- Another source of estimate is NDCs. Preliminary estimates made by simply aggregating the finance needs in existing NDCs, with a conditional component , amount to around USD 4.4 trillion (*Weischer et al., 2016*).

The Gaps- A Stark Reality in Adaptation Finance So Far

6.13 The above analysis confirms the wide gap between the availability of climate finance including for adaptation. But, the enhancement of climate actions in the developing countries context means more adaptation actions which would further require more resources to enable these actions. In essence, the scope, scale and speed of climate finance for achieving the objectives of the Convention and Paris Agreement is not witnessed. In the context of Covid-19 global outbreak, the economic uncertainties are expected to remain high through 2021. It is certain that public financing availability is likely to hit hardest, as will private domestic banking financing, so that the sum-total gap in financing to implement the NDC post-pandemic may well be orders of magnitude much higher. Mobilization trajectory of the international public finances through the new collective goals of finance under

the Paris Agreement as well as a much required and desired assessment of the USD 100 billion a year target set for the developed countries assume critical importance to gain the confidence and trust of the developing countries apart from transparency which is required for meaningful adaptation actions.

6.14 In short, the global climate finance architecture and governance is very complex. Absence of a multilaterally agreed definition of climate finance further complicates the matter. However, there are a number of channels for climate finance flows, both multilateral and bilateral. The various instruments have also been used such as grants and concessional loans, to guarantees and private equity. Yet, the transparency of climate finance flows remained a major concern. Apart from GEF and GCF, Parties have established special funds: SCCF, LDCF and the Adaptation Fund. A key concern as regards GEF revolved around the 'inadequacy of resources', which led to the demand for a dedicated climate change fund and the GCF was established in 2012. As of 31 December, 2020, GCF collected pledges worth USD 10.3 billion in the initial resource mobilisation launched in 2014. However, total amount confirmed was USD 8.31 billion only. For the First Replenishment period of GCF (2020-23), as of 31 December, 2020, total amount announced with credits was USD 9.99 billion and amount confirmed was USD 9.53 billion. The SCCF has supported 87 projects with USD 355 million in grants. The LDCF has financed 305 projects with approximately USD 1.6 billion in grants. Adaptation Fund has allocated over USD 778 million for 114 concrete projects in developing countries.

6.15 The reporting related to actual flows against the goal of USD 100 billion of climate finance a year by 2020 met with a number of criticisms and serious concerns

raised in the methodologies of accounting. The 2018 SCF Report outlines that total climate specific finance flows from Annex II Parties in 2016, amounts to around USD 38 billion which is less than 40 percent of the USD 100 billion target of climate finance. The report also mentions aggregate flows for mitigation remains greater than support for adaptation across all sources and confirms the level of climate finance is considerably below than what is required. One step to address this issue is to have a Synthesis Report on USD 100 bn by 2020 goal compiled by the SCF. The Synthesis Report will be a valuable input in the climate finance process and for future discussions. There are a number of estimates about the funding needs to take climate actions and making a case for trillions of dollars. The enhancement of climate actions in the developing countries context means more adaptation actions which would further require more resources to enable these actions.

6.16 The issues of transparency, credibility, adequacy, predictability are important in terms of a new goal on climate finance and in this context an agreed climate finance definition and accounting methodology is critical. In essence, the scope, scale and speed of climate finance for achieving the objectives of the Convention and Paris Agreement holds the key.

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CHAPTER 7: SUMMING UP AND SUGGESTIONS

7.1 The scientific assessments on climate change have clearly warned of a warmer Planet. The impacts of climate change can be very grave on various economic sectors. The Convention acknowledged the vulnerability of countries to the effects of climate change, particularly, developing countries due to their limited resources. Mitigation and adaptation are the two strategies to respond to climate change. Adaptation generally refers to adjustments in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects or impacts. Adaptation finance can be understood in terms of investments in activities that address current and expected effects of climate change.

7.2 Based on the review of literature and the analysis undertaken in this study, it emerges that the climate adaptation and its financing did not receive adequate attention in the early years of implementation of the Convention. However, with the release of IPCC Reports, it has gradually emerged as an important subject for policy decisions at the international level. Bali Action Plan adopted in 2007 established enhanced action on adaptation and finance as separate building blocks. Various other relevant COP decisions also spelt out the need for enhanced adaptation actions. The Paris Agreement has adaptation and provision of financial resources as important components. Yet the outcomes from the process can be argued as sub optimal as there is a lot left to be done in bringing adequacy and predictability of finances to address a problem of serious global concern. Major work also need to be done to bring the credibility and transparency to the accounting of adaptation financing flows. In light of the findings and conclusions reached as a result of this research, some suggestions are offered.

Operational Definition and Accounting Methodologies

7.3 The analysis highlighted the complexities around the operational definition of adaptation finance. As mandated by the multilateral treaty, it is imperative on all countries to take climate actions including adaptation to the adverse impacts of climate change on the basis of the principle of 'equity' and common but differentiated responsibilities. Based on these principles, it is imperative on industrialized countries to provide financial resources to the developing countries to take climate actions. Absence of an operational definition of adaptation finance has been a hurdle in the effective implementation of the Convention. There have been claims and counter claims by various countries regarding provision of climate finance and global community were deprived of knowing the accurate and correct numbers of actual adaptation finance flows. Hence, the priority should be to work towards a common operational understanding and definition as to what constitutes adaptation as well as a common accounting methodology as it is a crucial element for transparency, credibility, assessment and evaluation of climate finance. Further, it is necessary to distinguish between a development project and a climate change project for measuring, reporting and verifying adaptation finance. The climate relevance of the actions needs to be examined through a tool which assesses the relative importance of adaptation benefits compared with other sustainable development benefits.

7.4 The research and analysis in this study has been able to figure out the important elements of climate finance, various levels of capturing climate finance at a granular level, modalities for accounting, key steps for comprehensive reporting system of climate finance and the study has suggested a template for comprehensive accounting, which can capture the purpose of activity and type of activity separately including adaptation. Including these provisions in reporting through a UNFCCC

process can go a long way in bringing the transparency, clarity and comparability required in climate finance landscape and thereby clearly understand the size of adaptation finance.

7.5 Compliance mechanism agreed in the PAWP should be considered as an opportunity to discipline the reporting requirements of climate finance accounting. Compliance mechanism is binding on the countries to report accurately and correctly in a transparent manner including the finance provided by developed countries. The objective here should be to hold each country accountable for what it reports. The compliance mechanism under the PAWP permits a Compliance Committee and it can step in if there is adverse transparency findings (for example, significant inconsistencies in reporting). Consistent and steady flow of information through reporting under various rules/frameworks could generate its own pressure on Parties to enhance actions in future. Once a mutually agreed definition through the UNFCCC process is established, what the countries need to do is to report the finances provided accurately and correctly.

India's Response to Adaptation Strategies

7.6 It is imperative on developing countries to take actions taking into account their development priorities, objectives and circumstances. Indian Prime Minister has evoked the phrase *vasudhaiva kutumbakam* from the Maha Upanishad to explicate the country's approach. The emerging scientific information on climate change and the policy decisions at the international level has reflected in India's development process and actions as well. India through its development planning process attempted to mainstream these concerns in its relevant sector policies. In the

subsequent years, with increasing scientific evidences, greater policy attention to adaptation was accorded with the launch of NAPCC in 2008 and with the submission of NDC in 2015.

7.7 Government of India has also articulated that India is spending significant amount of resources for adaptation to climate variability, despite the competing demands on limited resources. Given the development imperatives, considerable efforts are still required to strengthen food security, provide adequate housing, access to energy, and ensure full access to basic social services. Climate impacts put an enormous, additional and unjustified burden on the country's developmental challenges. In view of this, the adaptation requirements have to be viewed from the poverty alleviation and social and economic development as resources has competing demands due to the development imperatives. Hence, the important step is the road map for implementing NDC which has to clearly spell out and assess how adaptation is factored in national-level plans. A significant step may be to consider climate markers in the budget documents. It has now become extremely important to identify, link, collate and monitor the various channels of climate finance across different sectors and activities. The response to the externality of Covid-19 pandemic in 2020 has had a serious contractionary impact on the economy. India's foremost priorities will lie in restoring the economy. In the middle of the global health and economic crises also, the climate crisis continued in 2020 with extreme climate events. Simultaneously, India need to provide sharper focus on strengthening adaptation actions in various sectors. India has been implementing various adaptation relevant programmes with gender responsiveness. Going forward, gender equality also has to be a major area of focus in implementing NDC.

7.8 Union Budget 2020-21 stated that NDC implementation would be done as apart of the budgetary process. However, climate change impacts are expected to worsen, which in turn implies that India has to go beyond its budgetary resources to take adaptation actions effectively. A transition to a climate resilient economy requires new, additional and climate-specific financial resources. While at the same time, there are unknown unknowns yet with respect to scale and speed of climate change, the sum-total gap in financing to implement the NDC in the post-Covid time may well be orders of magnitude now higher than what has already been estimated. While India may strive to do its best with domestic resources keeping in mind the imperatives of sustainable development and poverty eradication, international public finance flows at a speed and scale required still remains the critical enabler in taking these actions meaningfully.

Current Landscape of Adaptation Financing Flows

7.9 Addressing climate change and taking climate actions require enormous resources. There are a number of estimates about the funding needs to take climate actions and making a case for trillions of dollars. A UNEP report estimates that annual adaptation costs in developing countries currently is USD 70 billion.

7.10 The global climate finance architecture and governance is very complex with a number of channels (multilateral, bilateral) and various instruments (grants and concessional loans, guarantees and private equity). Multilateral channels include GEF and GCF and special funds: SCCF, LDCF and the Adaptation Fund. Inadequacy of resources with these funds always remained a concern. The analysis confirms that the aggregate flows for mitigation remains greater than adaptation and the level of

overall climate finance remained considerably below than what is required. In the absence of an agreed definition, the transparency of these flows primarily remained a major concern. The actual flows remained much lesser than what has been claimed and envisaged and it is nowhere near to the promised Copenhagen goal of USD 100 billion annually. One step to address this issue is to have a Synthesis Report on USD 100 bn by 2020 goal compiled by the SCF. The Report would be a valuable input in the climate finance process and for future discussions.

7.11 The enhancement of climate actions in the developing countries context means more adaptation actions which would further require more resources to enable these actions. In essence, the scope, scale and speed of climate finance for achieving the objectives of the Convention and Paris Agreement is crucial. Global action on climate change is conditional to the delivery of timely and adequate finance. One of the major tasks before the Parties in the future climate negotiations is to discuss and agree on transparency of support provided and to achieve the scope, scale and speed of climate finance required.

7.12 There have many new asks and demands on developing countries for reducing GHG emissions. It is a fact that no country in the world has been able to achieve a Human Development Index of 0.9 or more without an annual energy supply of at least 4 toe per capita. Even today, 60 percent contribution to the stock of GHG emissions are from developed countries. Although mitigation is important, adaptation is at the heart of climate actions for developing countries. Adaptation actions will have to be specific to national and local circumstances depending on the vulnerability of the different sectors of the economy and its implications.

7.13 India can sharpen its NDC as its economy progresses and prosper. With more development, share of climate adaptation expenditure is likely to be lesser. Should there be developed country assistance and the scope, speed and scale of climate finance is maintained, the momentum of climate actions can be maintained. If the lead role by developed countries in their climate actions as mandated in Paris Agreement is not adhered to, then climate finance remains as a major challenge for developing countries including India and the proposed NDCs may not fructify. An inclusive sustainable marco-economic development would require that the adaptation objectives are adequately responded. India's goal is equitable growth and the principles and provisions of the Convention and its Paris Agreement are critical for this endeavour.

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