Hanns Seidel Stiftung

Institut für Internationale Zusammenarbeit

Sandeep Kumar Dubey

Climate Action and the Indian Imperative

Due to their varied capabilities, collective responses of the parties to the Paris Agreement to climate change remain discrete and differentiated. The climate finance and the technology transfer to date from the developed countries to the developing ones fail to bridge the capability gap owing to the skewed focus on mitigation action. This paper attempts to explicate as to why it is important for India, a developing country, to raise its climate ambition by enhancing climate finance mobilisation, developing adaptation technology and strengthening its domestic polycentric climate governance.

Keywords:
adaptation action - climate action - climate change - climate finance - climate technology transfer - federalism - mitigation action - nationally determined contributions - Paris Agreement - polycentric climate governance

Climate Action and the Indian Imperative

|| Sandeep Kumar Dubey

Climate change has emerged as the most systematic threat to humanity.[1] Global warming of 2°C above pre-industrial levels would result in devastating impacts, causing sea level rise, a sea-ice-free Arctic Ocean, extreme droughts, precipitation deficits and water stress, warns the Intergovernmental Panel on Climate Change (IPCC) in its report, entitled "Global Warming of 1.5 ºC".[2] Alarmingly, the report also underscores that already in 2017, the warming reached approximately 1°C above the pre-industrial levels and has been steadily increasing further at the rate of 0.2°C per decade (high confidence).[3]

Given that the impacts of climate change are unfolding on a global scale, efforts at the international level – through supranational bodies – are being made to keep climate change within the assumed manageable limit. The Paris Agreement, concluded in 2015, aims at limiting the temperature well below 2°C and urges all the parties to the Agreement to pursue 'efforts to limit the temperature increase to 1.5°C'.[4] To limit the temperature below 2°C, the Agreement calls on the parties to 'prepare, communicate and maintain successive nationally determined contributions (NDC)'[5] which in essence 'outline and communicate their post-2020 climate actions'.[6] As of now, all of the 191 parties to the Paris Agreement have submitted their first NDCs, out of which eleven parties have already submitted their second NDCs as per the record of the interim NDC Registry. [7] The NDC Synthesis Report, published on 17th September 2021, avers that the estimated reductions resulting from the full implementations of the NDCs (including both conditional and unconditional elements) fall far short of what is required to limit the temperature well below 2°C.[8]

What is clear is that even if full implementation of all the NDCs takes place, the temperature increase is quite likely to surpass the 2°C above the pre-industrial levels. What is worse is that full implementation of the NDCs, especially of their conditional elements, is already doubtful as it would require huge domestic financial resources, international financial assistance, clean technologies, technology transfer from developed countries to developing ones and probably changes in the existing intellectual property (IP) protocols[9] which prevent smooth technology transfer and its use. Two things become important here in order to achieve the Paris Agreement's goal of limiting the temperature well below 2°C. One is that the parties to the Agreement must appropriately increase their climate ambition and the other is that the parties must ensure full and proper implementation of their respective NDCs. For this, adequate climate finance and technology transfer from the developed countries to the developing countries are a must as it would encourage the developing world to raise their climate ambition and help them meet their NDCs.

Trends in Climate Finance

When it comes to climate action to address climate change, the apparent position of the developing countries is that the developed countries should contribute to most of the mitigation efforts at their level based on the principle of common but differentiated responsibilities and respective capabilities (CBDR). At the same time, in pursuit of the principle of equity as mentioned in the Paris Agreement, the developed countries should also support the adaptation actions in developing countries to protect affected and vulnerable people from the adverse impacts of climate change. These sentiments were reflected both in the UNFCCC 1992 as well as Paris Agreement 2015. According to clause 4 of Article 4 of the UNFCCC, "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."[10] This was recapitulated in clause 1 of Article 9 of the Paris Agreement which says, "Developed country Parties shall provide financial resources to assist developing country Parties with respect to both mitigation and adaptation in continuation of their existing obligations under the Convention."[11]

Accordingly, developed countries transfer funds to developing countries to fight climate change. However, the funds transferred are predominantly for mitigation efforts whereas the developing countries would want more for adaptation action than mitigation, to deal with the adverse impacts of climate change. This was negotiated in the Paris Agreement, clause 4 of Article 9, which categorically adds that climate finance "should aim to achieve a balance between adaptation and mitigation".[12]

Talking about aggregate trends in (public and private) climate finance, a report of the OECD, entitled "Climate Finance Provided and Mobilised by Developed Countries in 2013-18" says, "Mitigation continues to represent over two-thirds (70%) of the 2018 total, adaptation 21%, and cross-cutting the remainder."[13] In the total climate finance, the report adds, "over 93% of private climate finance mobilised by developed countries over 2016-18 benefited mitigation (...) In contrast, adaptation and cross-cutting each accounted for 3% to 4%. The respective relative shares of mitigation, adaptation and cross-cutting were almost identical in each of the three years."[14]

The continued skewed climate finance focus on mitigation action has led to vast adaptation gap in the developing countries, which in turn has led to increase in climate risk. UNEP's Adaptation Gap Report from 2020 critically points out, "...while nations have advanced in planning and implementation, huge gaps remain, particularly in finance for developing countries and bringing adaptation projects to the stage where they bring real reductions in climate risks. Public and private finance for adaptation must be stepped up urgently, while faster implementation is required on adaptation projects."[15] The estimated annual adaptation cost in developing countries was USD 70 billion in 2020, which is expected to reach USD 140-300 billion in 2030.[16] Not much of it can be expected to be supported under climate finance if the skewed focus on mitigation action continues. For example, in 2016, 2017 and 2018, the climate finance provided exclusively for adaptation was USD 10.1 billion, USD 13.3 billion and USD 16.8 billion respectively.[17] This trend is unlikely to change given the fact that developed countries are yet to meet the USD 100 billion target for mitigation by 2020 as was agreed in the Copenhagen Accord 2009 made under COP 15. Clause 8 of the Accord reads, "In the context of meaningful mitigation actions and transparency on implementation, developed countries commit to a goal of mobilizing jointly USD 100 billion dollars a year by 2020 to address the needs of developing countries."[18] Former OECD Secretary-General Angel Gurría is reported to have said, "Climate finance to developing countries continues to grow but in 2018 was still USD 20 billion short of the 2020 goal of mobilising USD 100 billion."[19]

Here it would also be worth mentioning that within public climate finance, which constitutes the largest share of total climate finance provided and mobilised, developmental loans formed the largest chunk (see table 1), and that trend continues to rise. The repayment of these developmental loans place extra burden on the developing countries which already face financial barriers in meeting their existing climate ambition.

Public Climate Finance 2016-18

	2016		2017		2018	
	USD billion	%	USD billion	%	USD billion	%
Loan	33.6	71.64	39.8	73.03	46.3	74.44
Other instruments	13.3	28.36	14.7	26.97	15.9	25.56
Total	46.9	100	54.5	100	62.2	100

Source: data taken from OECD (2020), Climate Finance Provided and Mobilised by Developed Countries in 2013-18, OECD Publishing, Paris, https://doi.org/10.1787/f0773d55-en.

Trends in Technology Transfer

Like climate finance, in case of the technology transfer too, overt focus on mitigation can be observed. For example, as per the fourth Biennial Reports (BR) submitted by Annex I, Parties to the UNFCCC Secretariat, out of all the 24 technology transfers to India only four focused exclusively on adaptation and one on mitigation and adaptation both (see table 2). The skewed preference for mitigation action can be seen in the technology transfer from Germany to India. Post COP17, none of the technologies transferred from Germany were for adaptation (see table 3).

Technology Transfer to India (BR4)

No.	Country	Total	Mitigation	Adaptation	Both
1	Germany	1	1	0	0
2	Spain	4	4	0	0
3	Italy	2	2	0	0
4	Japan	15	11	4	0
5	Russia	1	1	0	0
6	Sweden	1	0	0	1
	Total	24	19	4	1

Source: data taken from UNFCCC, Biennial Reports Data Interface https://www4.unfccc.int/sites/br-di/Pages/TechnologySupport.aspx

Technology Transfer from Germany to India

Report	Total	Mitigation	Adaptation	Both
BR1	1	1	0	0
BR2	2	2	0	0
BR3	2	2	0	0
BR4	1	1	0	0
Total	6	6	0	0

Source: data taken from UNFCCC, Biennial Reports Data Interface https://www4.unfccc.int/sites/br-di/Pages/TechnologySupport.aspx

Lack of technology transfer for adaptation action poses a challenge to the full implementation of NDCs of the developing countries. For the adaptation technology transfer to happen adequately, a paradigm shift would be needed in approach, market and science. The Technology Executive Committee of the UNFCCC, in its Brief 6 rightly points out, "Compared to mitigation technologies, technologies for adaptation face further barriers, including the lack of a revenue model for some technologies, the need for buy-in (…) and uncertainty about the benefits of adaptation."[20]

India's Climate Action

Like other developing countries, India too faces serious threats emanating from climate change and thus it is imperative for India to take adaptation and mitigation actions to deal with climate change. Surrounded by seas and oceans from three sides and with the Himalayas in its backyard, India remains one of the most vulnerable countries to climate change. Among others, India's water resources are likely to be hit the most by climate change. India's Second Biennial Update Report to the United Nations Framework Convention on Climate Change (2018) foresees, that "Climate change will lead to an intensification of the global hydrological cycle and can have major impacts on regional water resources, affecting both ground and surface water supply."[21] In 2018, the Ministry of Environment, Forest and Climate Change commissioned a study on Climate Change and Water Resources in India. The study points out some alarming facts. It says, "Indian water demand is expected to rise by over 70% by 2025 and India is projected to suffer severe water stress by 2050 (...) The alarming rate of groundwater depletion, the variability of precipitation coupled with the uncertainty brought in by climate change, inefficient irrigation water use and deteriorating water quality on the one hand and burgeoning water demand on the other side depicts the grim reality of water crisis in our country."[22] The study further adds, "The water availability projected for the year 2025 is 1,434 cubic meter per year per capita…which will further dwindle to 1,140 cubic meters per year per capita by 2050, the year by which our population is expected to stabilise. The total water demand is expected to meet availability by 2025, and the absolute water requirement by 2050 is assessed to be 1,450 BCM (...)"[23]

Lifeline for the development processes, water as a sector needs urgent support in terms of adaptation action to ensure water security in India. Domestically, strong institutional structures and coordination among various governing bodies, sectors and stakeholders are a must to facilitate adaptation action in the water sector. In July 2016, the then Ministry of Water Resources, River Development and Ganga Rejuvenation (now Ministry of Jal Shakti) established a committee, the Committee on Restructuring the Central Water Commission (CWC) and Central Ground Water Board (CGWB) of India, to suggest institutional reforms for water governance to deal with the water challenges that India faces in the 21st century. The Committee, in its report, entitled "A 21st Century Institutional Architecture for India's Water Reforms", points out that there exists "very little co-ordination, discussion and collaboration" between CWC and CGWB, the two key water institutions within the same Ministry of Jal Shakti and these two institutions work "within the silos of groundwater and surface water respectively". The Committee suggested merging the two institutions. However, it did not happen due to internal protest and pressures within the Ministry.[24] Inter-ministerial coordination has been another hurdle on the way to effective water governance. Realising that, the two ministries – the Ministry of Water Resources and the Ministry of Drinking Water – were merged into a single ministry in May 2015 as Ministry of Jal Shakti with the hope that it would lead to an integrated water resources management.[25]

As indicated above, lack of coordination among different governing bodies has led to the emergence of data silos, and one of the biggest challenges to effective water governance is the institutional perseverance with maintaining these data silos.[26] the role of data in conflict resolution is public knowledge now. In the face of climate change, the states are likely to have different climate modelling and projections if they work in silos, leading to conflicting information. For example, lack of adequate data and information on Cauvery river water and a difference set of data provided by Karnataka and Tamil Nadu are the key reasons why the Cauvery river water dispute lingers on.[27] The Second Administrative Reforms Commission of India way back in 2008 had recommended – as part of the capacity building for water conflict resolution – that there be "a network of data banks and

databases integrating and strengthening the central, state and basin-level agencies and improving the quality of data and the processing capabilities".[28] To bridge the data gap, the National Water Mission under the National Action Plan on Climate Change (NAPCC) accords high priority in ensuring 'comprehensive water data base in the public domain'.[29]

In addition to the domestic efforts and churning on water governance, technology support from the developed countries would play a key role in transforming the water sector. However, the data on technology support from the developed countries to India shows that most of the technology support given or planned to be given are for the energy and transport sector, due to a skewed focus on mitigation action. Out of the ten developed countries, only one country (Japan) provided technology support in the water and sanitation sector.[30] This trend needs to change so as to catalyse the transformation of the water sector and enable it to withstand the impacts of climate change. Similarly, focus of finance needs to change adequately towards adaptation action which is at present, as India complains, "highly inadequate in scale, misplaced in scope without balance favouring mitigation strongly over adaptation, and dominated by loans rather than grants".[31]

On mitigation, India's position has been in line with the principle of common but differentiated and respective capabilities (CBDR). Like adaptation action, institutional support and governance play a major role in mitigation action too. The Fifth Assessment Report of the IPCC remarks, "Institutions and processes of governance (…) shape and constrain policy-making and policy implementation in multiple ways relevant for a shift to a low carbon economy."[32] In 2008, for the first time, India came up with a significant policy instrument i.e. the National Action Plan on Climate Change (NAPCC) to systemise and formalise its climate action to "assist the country to adapt to climate change"[33] and to "launch the economy on a path that would progressively and substantially result in mitigation through avoided emissions."[34] Mindful of its federal set up, in 2009 the Central Government asked the states to prepare and submit their respective action plans in line with the NAPCC to provide institutional support to operationalise the NAPCC.[35] As of today, 27 states and 6 Union Territories have drafted and submitted their State Action Plans on Climate Change (SAPCC) to the Central Government[36], which attempt "to mainstream climate change concerns in their planning process'.[37]

Given that the impacts of climate change are diverse in terms of time and scale, a polycentric approach holds the key to effective and enhanced climate action, especially in a federal institutional setting. According to the theory of polycentricism, developed by Elinor and Vincent Ostrom, "social systems with multiple layers of decision-making and a mix of shared and individual responsibilities among subunits often have advantages in the provision of public goods and other aspects of governance."[38] In Ostromian framework of polycentricism, both polycentricism and federalism are intricately interlaced, though polycentricism goes far beyond federalism and often resist being subjected to a hierarchical command structure and enjoys autonomous decision making power.[39] Michael D. McGinnis and Elinor Ostrom elaborate further, "A federal system may consist only of a sequence of neatly nested jurisdictions at the local, state or provincial, and national levels, but a polycentric system also includes cross-cutting jurisdictions specializing in particular policy matters, such as an agency managing a river basin that cuts across state lines."[40]

Polycentric governance lies at the heart of Indian policy due to its federal character. Whether India is a federal country is a highly debated subject and replete with conflicting opinions. This situation is primarily because of the fact that nowhere in the Constitution of India, the word 'federal' or 'federalism' appears. India is defined as a 'sovereign socialist secular democratic republic', but not as federal.[41] Notwithstanding, two commissions formed by the Government of India to look into the working of the Indian Constitution

found that creative and cooperative federalism is the ethos and working model of the Indian polity. The Sarkaria Commission, set up on June 9, 1983, to review the working of the existing constitutional arrangements between the Union and the States, says, "The Constitution as it emerged from the Constituent Assembly in 1949, has important federal features but it cannot be called 'federal' in the classical sense…it is unitary in extraordinary situations, such as, war (or emergency) and federal in normal times. Some authorities have classified it as a "quasi-federal" Constitution."[42] The report further adds, "Avoiding a dogmatic approach, they [the framers of the Constitution] fashioned a sui generis system of two-tier polity in which the predominant strength of the Union is blended with the essence of co-operative federalism."[43]

On February 22, 2000, another commission called *National Commission to Review the Working of the Constitution* was set up to examine, among others, "as to how best the Constitution can respond to the changing needs of efficient, smooth and effective system of governance".[44] The report of the Commission identified the Concurrent List as the main source of a functional, cooperative and creative federalism that exist in India. It describes, "The framers of the Constitution recognised that there was a category of subjects of common interest which could not be allocated exclusively either to the States or the Union…[A] harmonious operation of the Concurrent List could well be considered to be creative federalism at its best."

Does it really matter if India is a federal country or not when it comes to climate action and governance? As a mode of governance, federalism is preferred as it is believed to improve policy outcomes, by promoting administrative decentralisation.[45] In his article entitled, "Ends of Federalism", Prof Martin Diamond attempts to answer a very pinpointed question: what do we want from federalism? Talking in the context of American federalism, he says that deliberative aspects of administrative decentralisation is as important as the execution aspect, to make federalism more decentralist and people-led. He adds, "…administrative decentralization could not be understood merely as the local execution of centrally made policy…there is both a policymaking (deliberative) and an executive aspect to administration (…) mere local execution of central policy (…) will not suffice. What interests the local man is the policy itself…and not just the execution of the policy (…)"[46]

In India, the states have framed their own policies, in particular the State Action Plans on Climate Change (SAPCCs) to tackle climate change and responsibilities to implement them too lies primarily with them. However, owing to a lack of contextually relevant and localised climate science and knowledge, the states found it difficult to base their SAPCCs on crude scientific understanding and data on climate change for their respective states. A study found that at the time of developing their own SAPCCs, most of the states lacked the requisite knowledge to give a proper policy response to the threats of climate change.[47] For instance, Karnataka's SAPCC pointed out that the inadequacy of knowledge on the impacts of climate change puts a limiting constraint on the SAPCC, which it expected to be resolved under National Mission on Strategic Knowledge for Climate Change (NMSKCC), one of the eight national missions of the NAPCC.[48] The States did not have a designated resource centre on climate knowledge prior to the making of their SAPCCs. In fact, most of them either established a knowledge centre on climate change to prepare the SAPCC or committed in their SAPCC to establish one to address cross-cutting concerns. A case in point is the Madhya Pradesh's SAPCC which said, "In order to impart knowledge to stakeholders, a State Knowledge Management Centre on Climate Change (SKMCCC) (…) is being established".[49]

The situation has begun to change with the central government making efforts to strengthen the capacity of the states by setting up strategic knowledge centres for climate change, including climate change labs. That will help produce relevant knowledge on climate change which can be used by the states to frame an appropriate climate poli-

cy.[50] Karnataka became the first state to have established, with the Centre's help, the strategic knowledge centre for climate change and set up a climate change lab.[51] Under the NMSKCC, State Climate Change Cells have been set up in the 11 non-Himalayan states of India.[52][53] These Cells are mandated to "ensure a continuous updating of their SAPCCs".[54] The establishment of an adequate climate knowledge base at the state level would play a vital role in addressing cross-sectoral concerns, effecting trade-offs among various sectors and establishing synergies among them.

Against the above background of existing framework of international assistance, domestic institutional structure and prevailing governance, let us now ask how India fares when it comes to meeting its Paris commitments on climate actions, which "are largely financed from [its] domestic sources (…)"[59]? India's Minister of Power and New and Renewable Energy said in the G20 Energy and Climate Joint Ministerial Meeting held on 23 July 2021, that India remained 'committed to meeting its climate goals under the Paris Agreement' and 'is all set to exceed its NDC commitments before 2030'.[60] In his Independence Day speech on 15 August 2021, the Indian Prime Minister Narendra Modi proclaimed, "Today, India is the only country in the group of G-20 countries, which is moving fast towards achieving its climate goals".[61] What is the basis of such claims? India's NDC outlines eight targets in total, out of which five 'pertain to sustainable lifestyles; climate friendly growth path; climate change adaptation; climate finance; and technology and capacity building'.[62] The remaining three are quantifiable indicators which can be measured against the available data. The following table gives an overview of what was committed and what was planned under India's NDC.

India's three key NDC targets for the period 2021-2030

No.	Commitment	Progress
1	To reduce the emissions intensity of its GDP by 33 to 35 percent by 2030 from the 2005 level.	India has already achieved an emission reduction of 28% over 2005 levels; all set to exceed its NDC commitments before 2030.[55]
2	To achieve about 40 percent cumulative electric power installed capacity from non-fossil fuel based energy resources by 2030 with the help of transfer of technology and low cost international finance including from Green Climate Fund (GCF).	India already has achieved 38.5 percent installed capacity from renewables.[56]
3	To create an additional carbon sink of 2.5 to 3 billion tonnes of CO2 equivalent through additional forest and tree cover by 2030.	Latest data are not available to measure this, though India says it has made substantial progress. However, some reports suggest that on this front, India could not make much progress and is 'receding further from its target rather than improving'.[57] Experts believe that to achieve this target, India would need to double rate of forest cover expansion.[58]

Conclusion

Though India seems to be on track to achieve its Paris commitments, it needs to overhaul its domestic institutional structure, strengthen federal processes, promote innovation in climate technology and mobilize international support for climate finance and technology, especially for the adaptation action. As has been pointed out by the initial version of the NDC Synthesis Report that "much greater emission reduction efforts than those associated with the INDCs will be required in the period after 2025 and 2030 to hold the temperature rise below 2 °C above pre-industrial levels"[63], India an important player in global climate action is often urged to raise its climate ambition further to help meet the Paris goals. Recently, the US urged India to increase its climate ambition during India-US Climate Action and Finance Mobilization Dialogue launched on 13 September 2021.[64] Given the developmental gains as co-benefits of the climate action, it would be in India's long term interest to consider raising its climate ambitions.

|| **Sandeep Kumar Dubey**

Sandeep Kumar Dubey works as a program manager at Hanns-Seidel-Stiftung (HSS) India and is responsible for managing water and climate projects. Before he joined HSS, he was associated with the Manohar Parrikar Institute for Defense Studies and Analyses (MP-IDSA) New Delhi. He writes on issues related to federalism, regional water cooperation, climate change, national security and geopolitics. Recently he wrote a piece on the geopolitics of the Indo-Pacific, entitled "Pacifier in the Indo-Pacific" for The Pioneer, a leading national daily of India.

NOTES

1 Guterres, António (2018): Secretary-General's press encounter on climate change [with Q&A], URL https://www.un.org/sg/en/content/sg/press-encounter/2018-03-29/secretary-generals-press-encounter-climate-change-qa [25.08.2021]
2 IPCC (2018): Impacts of 1.5°C of Global Warming on Natural and Human Systems, URL https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Chapter3_Low_Res.pdf [24.08.2021]
3 IPCC (2018): Framing and Context, URL https://www.ipcc.ch/site/assets/uploads/sites/2/2019/05/SR15_Chapter1_Low_Res.pdf [25.08.2021]
4 UNFCCC (2015): Paris Agreement, URL https:// unfccc.int/sites/default/files/english_paris_agreement.pdf [25.08.2021]
5 UNFCCC (2015): Paris Agreement, URL https://unfccc.int/sites/default/files/english_paris_agreement.pdf [24.08.2021]
6 UNFCCC (n.d.): Nationally Determined Contributions (NDCs), URL https://unfccc.int/process-and-meetings/the-paris-agreement/nationally-determined-contributions-ndcs/nationally-determined-contributions-ndcs#eq-4 [25.08.2021]
7 UNFCCC (n.d.): NDC Registry (Interim), URL https://www4.unfccc.int/sites/ndcstaging/Pages/Home.aspx [24.08.2021]
8 UNFCCC (2021): NDC Synthesis Report, URL https://unfccc.int/sites/default/files/resource/cma2021_08_adv_1.pdf [20.10.2021]
9 Srinivas, K Ravi (2019): Climate Change, Technology Transfer and Intellectual Property Rights, URL https://www.ris.org.in/climate-change-technology-transfer-and-intellectual-property-rights [24.08.2021]
10 United Nations (1992): United Nations Framework Convention on Climate Change, URL https://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf [24.08.2021]
11 UNFCCC (2015): Paris Agreement, URL https://unfccc.int/sites/default/files/english_paris_agreement.pdf [25.08.2021]
12 UNFCCC (2015): Paris Agreement, URL https://unfccc.int/sites/default/files/english_paris_agreement.pdf [25.08.2021]
13 OECD (2020): Climate Finance Provided and Mobilised by Developed Countries in 2013-18, URL https://doi.org/10.1787/f0773d55-en. [25.08.2021]
14 OECD (2020): Climate Finance Provided and Mobilised by Developed Countries in 2013-18, URL https://www.oecd-ilibrary.org/docserver/f0773d55-en.pdf?expires=1629898504&id=id&accname=guest&checksum=8589C6552BC5DCFF11C6EFC7687B0FF4 [25.08.2021]
15 UNEP (2020): Adaptation Gap Report 2020 Key Messages, URL https://wedocs.unep.org/bitstream/handle/20.500.11822/34727/AGR_KM.pdf?sequence=3&isAllowed=y [25.08.2021]
16 UNEP (2020): Adaptation Gap Report 2020 Key Messages, URL https://wedocs.unep.org/bitstream/handle/20.500.11822/34727/AGR_KM.pdf?sequence=3&isAllowed=y [25.08.2021]
17 OECD (2020): Climate Finance Provided and Mobilised by Developed Countries in 2013-18, URL https://www.oecd-ilibrary.org/docserver/f0773d55-en.pdf?expires=1629907606&id=id&accname=guest&checksum=CA53707E6DCDCF87C3C9AAD70141AE0D [25.08.2021]
18 UNFCCC (2010): Report of the Conference of the Parties on its fifteenth session, held in Copenhagen from 7 to 19 December 2009, URL https://unfccc.int/sites/ default/files/resource/docs/2009/cop15/eng/11a01.pdf [06.09.2021]
19 OECD (2020): Climate finance for developing countries rose to USD 78.9 billion in 2018, URL https://www.oecd.org/newsroom/climate-finance-for-developing-countries-rose-to-usd-78-9-billion-in-2018oecd.htm [06.09.2021]
20 UNFCCC (2015): Enhancing Access to Climate Technology Financing, URL https://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TEC_documents/204f400573e64729

9c1a7971feec7ace/ea65db0ca9264cdbaefeb272dd30b34c.pdf [06.09.2021]
21 Ministry of Environment, Forest and Climate Change, Government of India. (2018): India Second Biennial Update Report to the United Nations Framework Convention on Climate Change, URL http://moef.gov.in/wp-content/uploads/2019/10/BUR-Report-Final-2019-1.pdf [06.09.2021]
22 Ministry of Environment, Forest and Climate Change, Government of India (2018): Climate Change and Water Resources in India, URL http://moef.gov.in/wp-content/uploads/2019/10/Climate%20Change%20and%20Water%20Resources%20in%20India(1).pdf [06.09.2021]
23 Ministry of Environment, Forest and Climate Change, Government of India (2018). Climate Change and Water Resources in India, URL http://moef.gov.in/wp-content/uploads/2019/10/Climate%20Change%20and%20Water%20Resources%20in%20India(1).pdf [06.09.2021]
24 The Hindu (2016): Central Water Commission facing an identity crisis, URL https://www.thehindu.com/news/ national/Central-Water-Commission-facing-an-identity-crisis /article14569815.ece [06.09.2021]
25 Govt. forms 'Jal Shakti' Ministry by merging Water Resources and Drinking Water Ministries, URL https://www.thehindubusinessline.com/news/national/govt-forms-jal-shakti-ministry-by-merging-water-resources-and-drinking-water-ministries/article27378402.ece [06.09.2021]
26 Gaur, A. (2020): Breaking down data silos in the water sector, URL https://www.indiawaterportal.org/articles/ breaking-down-data-silos-water-sector [06.09.2021]
27 First Post (2016): Cauvery water dispute: Panel analysing data given by Tamil Nadu, Karnataka, URL https://www.firstpost.com/india/cauvery-water-dispute-panel-analysing-data-given-by-tamil-nadu-karnataka-3009224.html [06.09.2021]
28 Second Administrative Reforms Commission, Government of India (2008): Capacity building for conflict resolution (Seventh Report), URL https://darpg.gov.in/sites/default /files/capacity_building7.pdf [06.09.2021]
29 Ministry of Jal Shakti, Government of India (2011): National Water Mission, URL http://nwm.gov.in/sites/ default/files/nwm16606419934.pdf [07.09.2021]
30 UNFCCC (n.d.): Technology Support, URL https:// www4.unfccc.int/sites/br-di/Pages/TechnologySupport .aspx [07.09.2021]
31 UNFCCC (2021): India Third Biennial Update Report to the United Nations Framework Convention on Climate Change, URL https://unfccc.int/sites/default/files/resource/INDIA_%20BUR-3_20.02.2021_High.pdf [07.09.2021]
32 IPCC (2014): 15: National and Sub-national Policies and Institutions, URL https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter15.pdf [07.09.2021]
33 Government of India (2008): National Action Plan on Climate Change, URL http://moef.gov.in/wp-content /uploads/2018/04/Pg0152.pdf [07.09.2021]
34 Government of India (2008): National Action Plan on Climate Change, URL http://moef.gov.in/wp-content /uploads/2018/04/Pg0152.pdf [07.09.2021]
35 Centre for Policy Research (n.d.): State Action Plans On Climate Change In India, URL https://www.cprindia.org/ projects/state-action-plans-climate-change-india [07.09.2021]
36 Ministry of Environment, Forest and Climate Change, Government of India (2020): State Action Plans On Climate Change In India, URL http://moef.gov.in /division/environment-divisions/climate-changecc-2/ state-action-plan-on-climate-change/ [07.09.2021]
37 UNFCCC (2015): India's Intended Nationally Determined Contribution, URL https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/India%20First/INDIA%20INDC%20TO%20UNFCCC.pdf [07.09.2021]
38 Vogler, Jan P (2020): The Political Economy of the European Union: An Exploration of EU Institutions and Governance from the Perspective of Polycentrism, URL http://www.janvogler.net/EU_Polycentrism.pdf [07.09.2021]
39 Vogler, Jan P (2020): The Political Economy of the European Union: An Exploration of EU Institutions and Governance from the Perspective of Polycentrism, URL http://www.janvogler.net/EU_Polycentrism.pdf [07.09.2021]
40 Carlisle, Keith and Gruby, Rebecca L. (2017): Polycentric Systems of Governance: A Theoretical Model for the Commons, URL https://onlinelibrary.wiley.com/doi/ 10.1111/psj.12212 [07.09.2021]
41 Ministry of Law and Justice (2020): The Constitution of India, URL http://legislative.gov.in/sites/default /files/COI.pdf [09.09.2021]
42 Inter-State Council Secretariat (1988): Chapter 1 Perspective, Report of the Sarkaria Commission, URL http://interstatecouncil.nic.in/wp-content/uploads/2015/06/CHAPTERI.pdf [09.09.2021]
43 Inter-State Council Secretariat (1988): Chapter 1 Perspective, Report of the Sarkaria Commission, URL http://interstatecouncil.nic.in/wp-content/uploads/2015/06/CHAPTERI.pdf [09.09.2021]
44 Ministry of Law, Justice and Company Affairs (2002): NCRWC Report, URL https://legalaffairs.gov.in/ncrwc-report [09.09.2021]
45 OER Services (n.d.): The Evolution of American Federalism, URL https://courses.lumenlearning.com/suny-amgovernment/chapter/the-evolution-of-american-federalism/ [10.09.2021]
46 Diamond, Martin (1973): The Ends of Federalism, URL http://www.citizenship-aei.org/wp-content/uploads/ Diamond_Ends_of_Federalism.pdf [10.09.2021]
47 Jogesh, Anu and Dubash, Navroz K. (2014): From Margins to Mainstream? State Climate Change Planning in India as a 'Door Opener' to a Sustainable Future, URL https://www.researchgate.net/publication/272300318_From_Margins_to_Mainstream_State_Climate_Change_Planning_in_India_as_a_'Door_Opener'_to_a_Sustainable_Future [10.09.2021]
48 Department of Ecology & Environment, Government of Karnataka. (2013): Karnataka State Action Plan on Climate Change, URL http://moef.gov.in/wp-content/ uploads/2017/08/Karnataka.pdf [15.09.2021]
49 Housing and Environment Department, Government of Madhya Pradesh. (2014): Madhya Pradesh State Action Plan on Climate Change, URL http://moef.gov.in/wp-content/uploads/2018/07/Madhya-Pradesh-01.pdf [15.09.2021]
50 Centre for Climate Change. (2019): Centre for Climate Change, URL https://empri.karnataka.gov.in/info-2/ Centre+for+Climate+Change/en [15.09.2021]
51 The Hindu. (2018): State gets a climate change lab, URL https://www.thehindu.com/news/national/karnataka/state-gets-a-climate-change-lab/article24506218.ece [15.09.2021]
52 Punjab, Madhya Pradesh, Haryana, Chattisgarh, Odisha, Telengama, Maharashtra, Karnataka, Kerala, Tamilnadu and Puducherry

53 Ministry of Science and Technology, Government of India. (2018): DST strives for climate change, URL https://dst.gov.in/dst-strives-climate-change [15.09.2021]
54 Ministry of Environment, Forest and Climate Change, Government of India (n.d.). India's Intended Nationally Determined Contribution: Working Towards Climate Justice, URL http://moef.gov.in/wp-content/uploads/2017/08/INDIA-INDC-TO-UNFCCC.pdf [15.09.2021]
55 Press Information Bureau (2021): Significant progress made by India in meeting its NDC targets, URL https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1738317 [15.09.2021]
56 Press Information Bureau (2021): Significant progress made by India in meeting its NDC targets, URL https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1738317 [15.09.2021]
57 Sethi, Nithin (2018): India Set to Achieve 2 of 3 Paris Agreement Goals: Draft Government Report URL https://thewire.in/environment/india-paris-climate-agreement-targets [15.09.2021]
58 Aggarwal, Mayank (2019): India needs to double rate of forest cover expansion to achieve Paris Agreement target, URL https://india.mongabay.com/2019/11/paris-agreement-goals-india-needs-to-double-forest-cover-expansion-rate/ [15.09.2021]
59 UNFCCC (2021): India Third Biennial Update Report to the United Nations Framework Convention on Climate Change, URL https://unfccc.int/sites/default/files/resource/INDIA_%20BUR-3_20.02.2021_High.pdf [15.09.2021]
60 Press Information Bureau (2021): Significant progress made by India in meeting its NDC targets, URL https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1738317 [15.09.2021]
61 Press Information Bureau (2021): English rendering of the text of PM's address from the Red Fort on 75th Independence Day, URL https://pib.gov.in/PressReleseDetail.aspx?PRID=1746062 [15.09.2021]
62 Lok Sabha, Parliament of India (2019): Un-starred question 1108, URL http://loksabhaph.nic.in/Questions/ QResult15.aspx?qref=7434&lsno=17
63 UNFCCC (2016):Synthesis report on the aggregate effect of INDCs, URL https://unfccc.int/resource/docs/2016/cop22/eng/02.pdf [15.09.2021]
64 Nandi, Jayashree (2021): Urgent to raise climate ambitions further: John Kerry, URL https://www.hindustantimes.com/india-news/urgent-to-raise-climate-ambitions-further-john-kerry-101631641118416.html [15.09.2021]