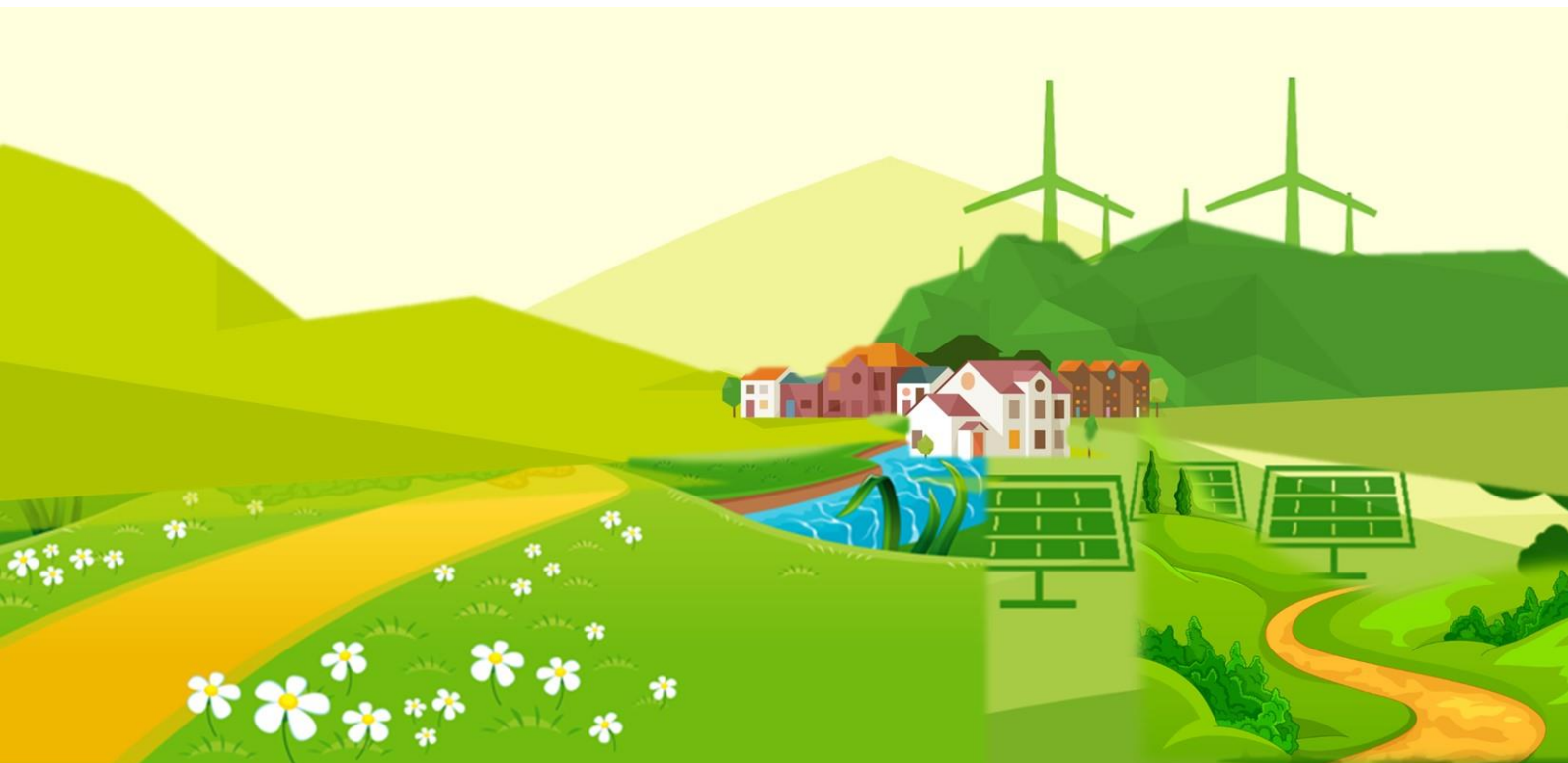


Climate Governance for Low-Carbon Development

The Role of the Paris Agreement for shaping the future of climate governance



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Introduction

Conference of Parties to the United Nations Framework Convention on Climate Change (UNFCCC) in its twenty-first session adopted the Paris Climate Agreement. The decisions (Decision 1/CP.21) have recognized climate change as ***an urgent and potentially irreversible threat to human societies and the planet and thus requires the widest possible cooperation by all countries***. This recognition expects effective and appropriate global climate governance by the participation of all countries to accelerate the reduction of global greenhouse gas emissions to hold the rising global average temperature to well below 2 °C above pre-industrial levels. The term “Low-emissions Development Strategies” was first introduced in the United Nations Framework Convention on Climate Change (UNFCCC) negotiations in 2008. In 2009, the Copenhagen Accord have recognized that “low-emission development strategies are indispensable to sustainable development”. In 2010, the Cancun Agreements also proposed that low-carbon development strategies (LCDS) is requisite to sustainable development and LCDS should be mandatory for developed countries and encouraged for developing countries. The Cancun Agreements encouraged “developing countries to develop low carbon development strategies or plans in the context of sustainable development” as part of their national mitigation action. The Paris Agreement brings all nations into a shared vision to undertake progressively ambitious efforts to transform the world towards a sustainable low carbon future. The Paris Agreement requires all Parties to put forward their best efforts through “nationally determined contributions” (NDCs).

Climate Governance: Optimistic directions in the Paris Agreement

The COP 21 decisions acknowledged that the need for urgency in addressing climate change by integrating Human Rights-based approach into the climate governance framework to drive the climate resilient development process.

Strengthening global response to sustainable development and poverty reduction: The Agreement aims to strengthen the global response to the threat of climate change through bottomless reduction of global greenhouse gas emissions, in the context of sustainable development and efforts to eradicate poverty. Article 3 and 4 of the Paris Agreement recaps that all Parties will undertake rapid reductions in anthropogenic emissions of greenhouse gases using the best available science, principle of equity and sustainable development framework to reach net zero emissions (a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases) in the second half of this century (i.e, after 2050).

Built-in climate justice framework: The global climate governance has built-in climate justice framework which is reflected on the acknowledgement of the specific needs and concerns of developing country Parties *arising from the impact of the implementation of response measures*. The inclusion of unique national circumstances, including special circumstances of the least developed countries and small island developing States in the Agreement provide scope for exercising the climate justice framework in the climate governance.

Principle of equity and the principle of CBDRRC construct the global climate governance architecture: Acknowledging climate change is a common concern of humankind, the Paris Agreement will be implemented to reflect the principle of equity and the principle of common but differentiated responsibilities and respective capabilities (CBDRRC), in the light of different national circumstances. The Principle of equity

in the UNFCCC negotiations implies a fair sharing of the costs of adaptation, mitigation and loss & damage incurred linked with climate change within and between countries, on the basis of historic responsibility, carbon emission trends, 2050 carbon budget, climate risk index and other relevant indicators shall must support the costs. The principle of CBDRRC recognizes the global inequalities in historical and current emissions of green-house gases, and the differences of current & future capacities to contribute in reducing current & future emissions of green-house gases in global context.

Nationally Determined Contribution (NDC) is the Nucleus of the Paris Agreement: Nationally Determined Contribution (NDC) is the nucleus of the Paris Agreement. NDC is the highest possible emission reduction ambitions or targets by any individual Party to the Paris Agreement in the light of their unique national circumstances, including special circumstances of the least developed countries and small island developing States. NDC with an aim to promote sustainable development, transparency and environmental integrity, encourage Parties to drive higher ambition in their mitigation and adaptation actions. Article 5 highlighted role of the Parties to conserve and enhance, as appropriate, sinks and reservoirs of greenhouse gases as referred to in Article 4, paragraph 1(d), of the Convention, including forests. In accounting for anthropogenic emissions and removals corresponding to their nationally determined contributions, Parties shall promote environmental integrity, transparency, accuracy, completeness, comparability and consistency, and ensure the avoidance of double counting. Mitigation co-benefits resulting from Parties' adaptation actions and/or economic diversification plans will also be considered as NDC.

Integration of the “Principle of Intergenerational Equity” for a low-carbon future: The future generations have legal as well as moral rights to protection from environmental threats and harms, especially such as are embodied in climate change¹. The Paris Agreement has the potential to shifting carbon-addicted global economy including the global food production system towards the low-carbon development pathways with respect to the principle of intergenerational equity. Since environmental degradation and climate change are major obstacles to addressing poverty², principle of intergenerational equity call for a low-carbon future, where poverty will be history. The principle of Intergenerational equity refers to the need for a just distribution of rewards and burdens between generations and fair and impartial treatment towards future generations irrespective of identity.

'Bottom up' Governance process: The Paris Agreement has a 'bottom up' structure in contrast to most international environmental law or treaties which are 'top down', characterized by standards and targets set internationally, for countries to implement.

Integration of Human Rights-based approach: The Agreement urges Parties to respect, promote and consider their respective obligations on human rights, the right to health, the rights of indigenous peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations and the right to development, as well as gender equality, empowerment of women and intergenerational equity when taking action to address climate change.

Universal access to sustainable energy: According to the Preamble of the Decision 1/CP.21, the promotion of universal access to sustainable energy in developing countries through the enhanced deployment of renewable energy will be a key focus of the global climate governance.

1 Burns H. Weston, 2012: The Theoretical Foundations of Intergenerational Ecological Justice: An Overview; Human Rights Quarterly 34 (2012) 251–266, The Johns Hopkins University Press

2 UNDP-UNEP, 2015. Mainstreaming Environment and Climate for Poverty Reduction and Sustainable Development. A Handbook to Strengthen Planning and Budgeting Processes. UNDP-UNEP Poverty-Environment Initiative.

A living Document to incorporate the best available scientific knowledge: The agreement recognizes that any effective and progressive response to the urgent threat of climate change shall incorporate the best available scientific knowledge.

Challenges and Gaps in the Paris Agreement and UNFCCC Negotiations

The reluctance of the major emitters for a transition to a low-carbon economy is lengthening the international climate change negotiations: The Paris Agreement, the new architecture for global climate governance, is an outcome of two decades of international climate change negotiations. Many might argue that due to the nature of climate negotiations which requires scientific evidence and technical expertise, such long-time is not atypical. Nevertheless, the lack of importance (often considering climate change as an environmental issue) as well as the lack of political commitment and technocratic framing of the climate issues in the developed countries are lengthening the climate negotiations. For example, the 2012 Doha Amendments which kept the Kyoto Protocol active with 20% reductions on 1990 levels for a 2nd Commitment Period (2013-2020), still remains non-operation due to lack of signatures and ratification by the Parties to the UNFCCC.

The framing of climate change in the UNFCCC Negotiations is often used to divert responsibility: In the international climate change negotiations, emerging emitting countries frequently try to frame climate change through political economy lens that anthropogenic climate change is political problem generated by excessive consumption patterns in the North, along with the inequitable patterns of global development. Developing countries demand for the realization of historical responsibility by the Developed countries to reduce global emissions, deliberately divert global attention away from emitting developing countries own coal-dependent development trajectory. On the other hand, developed nations try to escape that they were not aware about the historical emissions before the 1990s. To divert their historical responsibility, they are putting much emphasis on current emissions reduction responsibility of all nations. In developed countries, climate change is often framed as a technological problem to divert the international debate on historical responsibility about the source of emissions as well as the history of excessive emissions in the North.

Major emitters do not want a legally binding target: Prior to UNFCCC COP21 in Paris, the European Commission had officially proposed that the 2015 Agreement should be in the form of a Protocol with legally binding targets under the UNFCCC³. The Paris Agreement (PA) neither has any rigid targets for Greenhouse Gas (GHG) control, nor any commonly agreed baselines for reductions. Major emitters from both developed and developing countries did not want to have legally binding targets due to concerns that energy transition impacts on their economy and national development. For example, in 2014, the Obama Administration pronounced jobs as a priority over climate protection⁴. The persistent effort of the developed countries finally managed to distribute the anticipated emissions among all the nations of the world, keeping themselves free from any legal obligations for both historical and future emissions. Major emerging emitters like China and India expects such voluntary approach is helpful for future free riding of emissions. It is true that the world cannot afford to destroy the future by haunting too much on historical responsibility. In fact, the world needs to act earnestly to integrate low-carbon practices within their domestic borders by incorporating the historical mistake of uncontrolled fossil-fuel driven carbon emissions.

Paris Agreement depends upon the voluntary implementation of the “principle of progression”: The Nationally Determined Contributions (NDCs) which are voluntary pledges by the countries build the core

³ European Commission, 2015. "The Paris Protocol: A Blueprint for Tackling Global Climate Change Beyond 2020." Ref. no. COM(2015)81

⁴ Ash, Kyle., 2014. "Paris Treaty Is Best Even with USA as a non-Party: But the USA Has No Ratification Dilemma." Greenpeace USA.

architecture of the Paris Agreement. NDCs success depends upon the implementation of the “Principle of Progression” (Each further ambition should be more ambitious than the previous one). The mobilization of international climate finance which will be the key challenge in implementing Paris Agreement, also need to respect the principle of 'progression' as well (a progression beyond previous efforts).

Paris Agreement is insignificant without domestic climate policy measures: The Paris Agreement (PA) is a legally binding agreement but mitigation or greenhouse gas emission reduction commitments are not legally binding in the Paris Agreement. Progressive, independent and voluntary ambitions of emission reductions have replaced the legally binding commitments. Nevertheless, internationally legally binding obligations are meaningless without domestic policy. The integration of new international agreements in national legal systems depends on the country adoption of so-called dualist or monist legal systems. Dualist legal systems must translate international law into domestic law, whereas monist systems regard ratified treaties as the law of the land⁵. Ambitious domestic action on climate change is linked with vision-oriented but practical international agreement. A legally binding agreement will not be effective for slowing down the global carbon emission, if there is no ambitious domestic action on climate change. Since, the implementation of the Paris Agreement is based on the commitments of all UNFCCC parties both developed and developing countries to reduce greenhouse gas emissions through NDCs; it is expected that it will come into force much sooner than the Kyoto protocol. In 1997, only 35 countries were agreed to a national, legally binding, 5% GHG emissions reduction targets under the Kyoto Protocol. In 2005, the Kyoto Protocol came into force.

A visual baseline of emission responsibility is absent: The international climate negotiations basically lack a visual baseline of emission responsibility that can be measured within a reasonable timespan. The analysis of the climate negotiations reveals that 2020 could be the demarcation boundary of responsibility. ***As climate change measurement needs 30 years of average weather patterns, the baseline of anticipated emission responsibility can use 30 years as a unit to redefine or readjust emission responsibility.***

The quest for the best available scientific knowledge may create knowledge inequality: Climate change is often interpreted merely as an environmental issue, and hardly seen as a development concern in its own right⁶. One study recognized that the supply of climate change knowledge is biased towards richer countries, that could have implications for the quality of the political decisions countries and regions make to prevent and adapt to climate change⁷. The cultural understandings of climate change mitigation may not be as sound as previously thought⁸.

Recommendations

Paris Agreement calls for a paradigm shift towards low-carbon development

The ultimate aim of the UNFCCC was to stabilize GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system (Article 2). According to the Article 2 of the Paris Agreement, *Parties have to hold global average temperature increases “to well below 2°C” and “pursue efforts” to limit this to 1.5°C, in order to reduce the risk and impacts from climate change.* The Article 2 of the Paris Agreement calls for a paradigm shift of the economic development away from its dependency on fossil fuels and energy intensive systems both at global and national level. The sustainable reduction of

5 David Sloss, (2011), Domestic Application of Treaties, Available at: <http://digitalcommons.law.scu.edu/facpubs/635>

6 Schaar, Johan. (2008) “Overview of Adaptation Mainstreaming Initiatives”. Commission on Climate Change and Development.

7 M. Pasgaard, N. Strange. 2013: A quantitative analysis of the causes of the global climate change research distribution. *Global Environmental Change*, 2013; 23 (6): 1684 DOI:10.1016/j.gloenvcha.2013.08.013.

8 Corbera, Calvet-Mir, Hughes and Paterson, 2015: Patterns of authorship in the IPCC Working Group III report, *Nature Climate Change* doi:10.1038/nclimate2782.

carbon emission demands a reshaping of the global economy towards cleaner forms of production, not just in energy, but also in industry, transport and land-use. The Paris Agreement put much emphasis on international finance for adaptation and technology transfer for a low carbon future. However, to drive a low-carbon economy demands gradual transformation of the existing carbon dependent socio-economic development paradigm. In 2010, the Cancun Agreements also recognized that *“addressing climate change requires a paradigm shift towards building a low-carbon society that offers substantial opportunities and ensures continued high growth and sustainable development, based on innovative technologies and more sustainable production and consumption and lifestyles, while ensuring a just transition of the workforce that creates decent work and quality jobs”* (1/CP.16.10).

The World must act together to build a low-carbon development paradigm

The Greenhouse Gases (GHGs) have no respect for the geopolitical boundary of any country. When any country or company or individual wherever on the earth emits greenhouse gases, they quickly accumulated in the atmosphere and roam around the world for the next 100 years. In each day, the new anthropogenic emissions from burning of fossil fuels are adding carbon stocks in the atmosphere and changing the climate. The roaming nature of Greenhouse Gas (GHG) emissions makes climate change a global concern. Although the Nations have authority over the sky within their boundary, atmosphere in true sense is a global asset. The lifetime of fossil fuel released CO₂ in the atmosphere is a few centuries⁹ or more than 100 years¹⁰. The current status of the developed countries have obtained through high-carbon growth and are responsible for around half of the CO₂ emissions since the mid-eighteenth century¹¹. The current trends in Global CO₂ Emissions shows that only six countries are responsible for 63% of global emissions (China-30%, USA-15%, India-7%, Russia-5%, Japan-4% and Germany-2%)¹². Developed countries are responsible for 79 percent of historical carbon emissions¹³ and the current climate change is primarily driven by historic emissions.¹⁴ However, discounting the historical or future responsibility of carbon emissions disregards the Principle 21 of the 1972 UN Conference on the Human Environment that States have, *“the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.”*

Low-Carbon Development Paradigm requires sustained reduction of carbon emissions through the Nationally Determined Contributions (NDCs)

The Paris Agreement is principally about ambition, intentions, objectives, and high-level national contributions. The current country pledges are too low to lead to a temperature rise below the Paris Agreement temperature limit of "well below 2°C" above pre-industrial levels¹⁵. Global temperature has been increasing at a rate of 0.2°C per decade over the past 30 years¹⁶. The world needs 80% emission reductions on 1990 levels by 2050 in order to stand a chance of avoiding temperature rises above 2°C¹⁷. If all the NDC pledges submitted by the Parties to the UNFCCC are fully implemented, the world will still remain on an emissions path closer to 3°C warming¹⁸. This envisage that keeping the Paris objective of “well below” 2°C requires sustained reduction of carbon emissions from both developed and developing countries over many

9 Archer, D. 2008: The Long Thaw: How Humans Are Changing the Next 100,000 Years of Earth's Climate, Princeton Univ. Press,

10 Flannery, T. 2005: The Weather Makers: The History and Future Impact of Climate Change 162, Atlantic Monthly Press, New York

11 Stern, N. 2015. Why are We Waiting? The Logic, Urgency and Promise of Tackling Climate Change. Cambridge, MA: MIT Press

12 Olivier, J.G.J., Janssens-Maenhout, G., Muntean, M., Peters, J.A.H.W., 2015. Trends in Global CO₂ Emissions: 2015 Report. Ref. no. JRC98184, PBL1803. PBL, JRC, IES, The Hague.

13 <http://www.cgdev.org/media/who-caused-climate-change-historically>

14 Matthews HD, Gillett NP, Stott PA, Zickfeld K, 2009: The proportionality of global warming to cumulative carbon emissions. Nature 459

15 Rogelj, Joeri et al. 2016: "Paris Agreement climate proposals need a boost to keep warming well below 2C". Nature 534 (7609): 631-639.

16 Hansen, J., R. Ruedy, M. Sato and K. Lo (2010), Global Surface Temperature Change, New York: NASA Goddard Institute for Space Studies

17 Parry, M., Palutikof, J., Hanson, C., Lowe, J., 2008. Squaring up to reality. Nature Reports Climate Change 2, 68-70.

18 UNEP, 2015. The Emissions Gap Report 2015. United Nations Environment Programme (UNEP), Nairobi.

decades. To significantly reduce the risks and impacts of climate change, the global climate governance has to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels.

Nationally Determined Contribution (NDC) shall address domestic emission inequalities

In every country, there is a developed north (high-income group) and developing south (low-income group). For example, in the Indian city of Pune, the electricity use of the high-income group is nine times higher than the low-income group and the upper-middle class of South Asia consumes almost the same amount of energy as the middle class in many OECD countries¹⁹. The avoidance of difficult domestic structural changes for ambitious emission reduction, and the avoidance of challenging the unsustainable pattern of production and consumption within the national boundary are generating emissions inequalities in both developed and developing countries. The extension of the principles of equity and the CBDRRC from the international sphere to the domestic sphere is essential for meaningful climate governance through Nationally Determined Contribution (NDC). NDC should be interpreted in addressing the emission inequality within the context of national sustainability and should be institutionalized at the national level to local level. The country commitments on NDC (Nationally Determined Contribution) under the UNFCCC is expected to directly contribute to the national implementation of the global 2030 Agenda.

Nationally Appropriate Mitigation Actions (NAMAs) have the potential to accelerate the low-carbon development

The absence of “NAMA” term in the Paris Agreement and COP 21 Decision, has generated confusion and uncertainty among developing countries and NAMA practitioners. Within the UNFCCC, NAMA was introduced and promoted as a means for developing countries voluntary contribution to the global mitigation effort through international support. Nevertheless, the term “domestic mitigation measures” to achieve national NDC goals included in the Article 4.2 of the Paris Agreement creates scopes for NAMA to be continued in the international climate cooperation process. The Paris Agreement’s aim for holding the global temperature rise to the “well below 2°C” presents an opportunity to use NAMA for delivering significant emission reductions; as an instrument for receiving international climate finance for mitigation as well as communicating NDC implementation progress²⁰. NDCs will now be a cornerstone of the global mitigation approach and the NAMAs as specific mitigation actions could be one of the key implementation instrument for NDCs. The NDC as an expression of overall national mitigation ambition driven by international political commitment, can address existing gaps in the NAMA development process. NAMAs can play a key role in implementing the Paris Agreement, specially meeting ambitious national targets of NDCs. According to the Article 13.7 of the Paris Agreement, each party has to provide “information necessary to track progress in implementing and achieving its national determined contribution”. NAMAs MRV aspects can play a role in supporting transparency element of the Paris Agreement. Until now, most of the NAMAs have been developed as ‘stand-alone’ emissions reduction projects, and not a well-coordinated action to shift the particular emission producing sector as-a-whole towards a low emissions pathway. The UNFCCC has invited “the Intergovernmental Panel on Climate Change to provide a special report in 2018 on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways”. This also envisage that more roles are ahead for NAMAs in the coming days.

Private and Public entities shall not hide their emissions in the shadow of the country emissions

Ninety (90) oil, natural gas, coal, and cement entities (50 leading investor-owned, 31 state-owned, and 9 nation-state producers) are responsible for nearly two-thirds (63 %) of historical emissions of carbon dioxide (1854- 2010) and methane (1751- 2010) and half of their total emissions are in the last 24 years (1986-

¹⁹ Siddiqi, Toufiq A. 1995. Energy Inequities within Developing Countries: An Important Concern in the Global Environmental Change Debate. *Global Environmental Change* 5 (5): 447–54.

²⁰ Cameron and Harms, 2015 - NAMAs and INDCs – interactions and opportunities, Enhanced NAMA Cooperation Working Group, Nov 2015.

2010)²¹. The majority of anthropogenic carbon dioxide emissions arise from energy consumption especially in the transport sector and electricity generation (coal fired power stations). Future CO₂ Emissions from Existing Energy Infrastructure is expected to emit 496 billion tons of CO₂ over the next fifty years,²² which demands the reduction of future emissions from business-as-usual projections.

Global climate governance needs active participation of the global civil society

The global civil society as non-Party stakeholder has been building public awareness and mobilizing people and creating pressure on Party stakeholders since the very beginning of the international climate negotiations. Decision 1/CP.21 encourages non-Party stakeholders to increase their engagement in the existing technical examination process on mitigation (paragraph 109) and adaptation (paragraph 124). Decision 1/CP.21 also encourages Parties to work closely with non-Party stakeholders to catalyze efforts to strengthen mitigation and adaptation action. The implementation of the Paris Agreement depends on the political support governments and when government changes, the political support may also change. Civil society should continually remind governments about fulfilling the national commitments. Civil society should emphasize on continuous information dissemination to help people to understand the changing discourse on climate change in order to receive long-term support from the public. In the context of awareness raising, civil society shall target government ministries and political leaders. Apart from the international climate negotiations, civil society should also target Group of Twenty (G-20) forum for advocacy on low-carbon future because the G20 economies account for nearly 80% of world carbon emissions.

Well-defined framework on the low-carbon development is required for accelerating the climate governance

The concept of 'low-carbon development' has emerged to address the challenge of linking economic strategies to reduce greenhouse gas emissions (GHGs). There is no internationally agreed-upon definition of the Low Carbon Development (LCD) in general, which imposes both challenge and opportunity. The challenge is that each country, depending on national development prospects and capacities, needs to work out its own approach to low-carbon development. The opportunity is that devising low-carbon development approaches helps countries to identify areas of intervention for lowering greenhouse gas emissions without compromising sustainable development. Climate Resilient Development (CRD), Climate Compatible Development (CCD) or Low-Emission Development (LED) often used as synonym of LCD to label development that is compatible with lowering carbon emissions but sustaining economic growth. Low-Carbon Development Strategies (LCDS) or Low-Emission Development Strategies (LEDS) are generally used to define specific and time-bound strategies that combine development and climate urgencies for reducing greenhouse gas emissions without hindering the sustainable growth of the economy and human welfare.

The following definitions are some guiding outline to understand the terms and concepts linked with Low-Carbon Development paradigm:

Low-Carbon Development (LCD) can be defined as an approach that integrates climate change mitigation mechanisms to reduce anthropogenic greenhouse gas emissions through the socio-political and economic development process.

Climate Resilient Development (CRD) approach focuses on climate change adaptation for building people's

²¹ Richard Heede, 2013: Tracing anthropogenic carbon dioxide and methane emissions to fossil fuel and cement producers, 1854–2010, *Climatic Change* (2014) 122:229–241, doi:10.1007/s10584-013-0986-y

²² Davis S.J., K. Caldeira and H.D. Matthews. 2010. "Future CO₂ Emissions and Climate Change from Existing Energy Infrastructure." *Science* (329)5997: 1330–1333.

capacity to address any adaptable climate-related risks and vulnerabilities.

Climate-compatible development (CCD) safeguards development from climate impacts (climate-resilient development) and reduces emissions or keeps them low without compromising development goals (low-emissions development)²³.

Low-Carbon Climate Resilient Development (LCRD) can be defined as inclusive development framework that addresses both *adaptation with climate risks and vulnerabilities*, and *mitigation of anthropogenic greenhouse gas emissions* simultaneously without hindering the national or international *sustainable development goals* (for example, poverty reduction). Experts have recommended three priority areas of climate resilient development²⁴: (1) strategic decisions with a long time horizon, such as urban settlement planning (2) low-regrets measures that have an immediate development impact as well as climate-resilience benefits; and (3) measures with long lead-times, such as research and development, which take time to come to fruition.

National Low-Carbon Development Pathway (NLDP) is an integrated policy framework to identify how a country can benefit from pursuing a low-carbon development pathway, and present opportunities, long-term goals, and country-driven priorities for actions in key sectors.

Low Carbon Development Strategies (LCDS) describe forward-looking national economic development plans or strategies that encompass low-emission and/or climate-resilient economic growth. LCDS are primarily intended to help advance national climate change and development policy in a more coordinated, coherent and strategic manner²⁵. The ultimate aim of a low-carbon development strategy is to catalyze concrete actions that support development with lower emissions. LCDS describes a pathway toward low carbon development that is embedded in national strategic development planning.

Conclusion

The Paris Agreement is a consensus-based global climate governance framework to significantly reduce the risks and impacts of climate change by holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels. Promoting sustainable development while mitigating climate change is the foremost development challenge of the world. IPCC evidently pointed out that meeting the 2°C target requires a radical transformation in the global energy infrastructure in the shortest time possible. The limiting the greenhouse gas emissions requires long-term and consistent focus on low-carbon economy to support low-emission or green growth development practices and policies. To reduce carbon intensity, global or national economies must embrace gradual shift away from fossil-fuel energy. The transformation towards low-carbon economy may require new institutional and governance arrangements. International co-operation, such as climate finance and technology transfer, is needed to help developing countries to address short-term trade-offs involved with the low-carbon transition.

²³ CDKN, 2013: 'Defining Climate Compatible Development'. <http://cdkn.org/resource/defining-climate-compatible-development-3/>

²⁴ Fankhauser, S. and McDermott T (eds). 2016. The economics of climate resilient development. Cheltenham: Edward Elgar.

²⁵ OECD and IEA 2010: Low-Emission-Development Strategies (LEDS): Technical, Institutional and Policy Lessons,