

## **Editor's Note**

# **Sustaining Development in the Times of Climate Warming**

**T**he world faces a grim choice – it either takes all necessary measures to protect nature and life on earth by cutting down the greenhouse gases that are rapidly bringing about global warming, or it suffers its devastating consequences. The impact is already being felt across a wide spectrum-- in the untimely and intensified rainfall in many areas, treacherous cyclone and flood patterns, depleting biodiversity, melting of invaluable glaciers in the Himalayas, the Tibet plateau and the Antarctic, destruction of forest covers as more land is claimed for habitation and food production for a rising populations, extreme heat and rising ocean levels, among others. Economic growth will not only be arduous in this bleak environment but won't mean much if the world becomes unliveable for most beings.

The emerging environmental crisis caused by the adoption of narrow gross domestic product and growth-centric economic models and the need for a transition to a sustainable development model began to be globally recognised and articulated nearly five decades ago with the United Nations Conference on the Environment in 1972. A series of such conferences followed on the rights of people to food, housing, clean water, etc. However, the concerns thereafter receded as other international issues came to the fore. The thread was picked up by the publication of the report 'Our Common Future' by the UN in 1987, and the setting up of the Intergovernmental Panel on Climate Change (IPCC) by the UN in 1988 for gathering scientific evidence and advancing knowledge on human-induced climate change. These were followed by the Earth summit in Rio in 1992 that adopted the principle of 'common but differentiated responsibilities' (CBDR) for dealing with global warming. The United Nations Framework Convention on Climate Change (UNFCCC) was adopted the same year, and the first Conference of the Parties (COP-1) was held in Berlin in 1995. At the 1997 UNFCCC-COP 3 at Kyoto, the parties adopted a significant Protocol to the 1992 UN Convention on Climate Change that committed the state parties to reduce greenhouse gas emissions based on the scientific consensus that global warming is occurring and that human-made CO<sub>2</sub>

emissions are driving it. The Protocol, which came into effect in 2005, called for the reduction in emission of six green-house gases, with carbon dioxide being the most important. It also embraced CBDR as the basic principle for dealing with the environmental challenges, with the developed economies tasked to lead the way to reduce greenhouse gas emissions.

Yet scepticism within policymaking and academic circles, especially in the US, about the need for mitigating measures and changes in economic policies; the US opposition to CBDR and insistence that the developing countries such as China, India and others must also be part of the emission reduction efforts; a series of international wars in the Gulf, North Africa and Afghanistan; and the impact of the 2008 global financial crisis meant significant action by the leading countries to address global warming and its consequences would be limited in the post-Kyoto decade and a half. However, global public opinion and official thinking began to alter with growing evidence of and consequent concern about the link between accumulation of greenhouse gases, especially carbon, chlorine and bromine produced by the burning of fossil fuels, and the depletion of the ozone layer that protects the earth's atmosphere from ultraviolet rays of the sun and overheating.

The Agreement that emerged from the COP-21 held in Paris indicated a new global consensus and greater urgency to find ways to control and reduce carbon dioxide in the atmosphere. There was also a significant shift from Rio's principle of 'common but differentiated responsibilities' and the Kyoto Protocol's requirement that only developed countries reduce emissions. The Paris Agreement recognized that controlling global warming is a shared problem and required all countries to initiate Intended Nationally Determined Contributions (INDCs) for achieving the agreed goals. However, with the Trump administration withdrawing the US from the Paris Agreement, urgent global action to arrest climate change remained disjointed. The United States, Europe and China being the principal emitters of greenhouse gases no meaningful international action could be possible without their strong commitment on urgent and time-bound emission reduction. Since then, the Biden administration has re-joined the international efforts, the developed countries have set 2050 as their national targets for net zero-emission, and in all 66 countries have announced their net-zero target dates. The two largest developing economies -- China and India have committed themselves to 2060 and 2070 as their net-zero dates. State parties have also announced their latest NDCs for 2030 at the COP-26 in Glasgow in 2021.

## **New Issues**

While greater effort by the leading states and rising public consciousness about climate change are now visible, three issues continue to trouble concerted global action.

One, arresting climate change necessitates urgent collective global effort. However, most developing countries are not in a position to pursue effectively their urgent developmental tasks while they are required to move away from fossil fuels as their basic source of energy. Energy transition involves large costs, technology and investments that they do not have. The costs of sustainable development, emission mitigation and adaptation have risen exponentially and become more complex in the post-Covid phase. The developed countries need to keep their commitment to provide financial assistance for their sustainable development strategies. This is the least they can do given the fact that Europe and the United States as the initial industrial states have been the largest contributor of greenhouse gases in the post-industrial revolution period. They continue to claim the bulk of the 20 percent global carbon budget left for the industrialisation of the developing states such as India. Moreover, so far their commitment to financially assist emission mitigation and climate adaptation in the developing world has been scant. The 2050 net zero deadline set by the developed world instead of an earlier date, say 2040, also delays urgent collective action and adds to the environmental stress.

Two, the energy transition to a non-fossil fuel order is still in its early phase. Renewables such as solar and wind power on which states such as Germany, Denmark, the UK and others have heavily invested provide intermittent supplies and are dependent on fossil fuels and nuclear energy for providing stable back-up supplies. This transitional strategy is prone to risks in supplies and price affordability for the consumers, as several European countries faced last winter. New technologies and energy sources such as hydrogen are still in the development stage in the leading economies. Their availability in the developing world is low and their dependence on the developed world high, uncertain and risky.

Finally, the leading economies need to rethink and reorient their economic models to incorporate environmental costs, and the true value of natural resources such as water, air, soil, forests and biodiversity. This would set the stage for real collective action to transform the current global climate and meet the goal of keeping global heating to below 2 degree centigrade. Having set aside the Rio and Kyoto principle of

CBDR, the West needs to think beyond self-interest and contribute significantly to advance the collective interest to contain and reverse climate change.

### **India's Significant Efforts**

India made bold carbon mitigation targets at the COP-21 in Paris in 2015 and even higher commitments at the COP-26 at Glasgow in 2021. It has so far been a strong performer, especially in renewable energy. The commitments made to the world by Prime Minister Modi underline the government's vision and desire to achieve a 'Net zero' carbon order by 2070. The path towards net zero would mean a transition to a non-fossil fuel based new economy, sustainable development, a pollution free environment, green cities and villages, expansion of forest cover, preservation of biodiversity, protection and improvement of soil health, and a transformation in water conservation and utilisation. Achieving these targets involves an integrated sustainable development strategy in which climate mitigation becomes a transformative growth engine for the country.

India's alternative future entails a successful energy transition from fossil fuel to a non-fossil fuel based future shaped by solar and wind power, electric batteries, hydropower, nuclear energy and hydrogen. While India has already taken major steps in this direction, current energy supplies are still largely dependent on coal and to a lesser extent, on hydro-power for electricity, and on oil and gas for transportation and domestic use. A full transition towards 'net-zero' in the 50-year time frame (2021-2070) would, hence, be possible only if two important conditions are fulfilled: 1) New technologies and large investments are available for rapidly expanding production and distribution of non-fossil based alternative energy; 2) the new energy mix would be affordable, enabling adoption for meeting the rapidly expanding energy needs of the country for industrialisation, agriculture, transportation, services, and domestic consumption. In addition, alternative energy should be available in rising quantities within the country so that rapid economic growth can be sustained, and the country can avoid costly, risky and uncertain import dependence that characterises India's fossil-fuel based present order and poses both economic and security challenges.

At this point a swift and significant shift to non-fossil fuel-based energy order appears daunting given the higher cost of production and distribution of green energy, the high import dependence for solar cells and wind power equipment, limitations of

technology and capital. Even developed economies such as the EU, the US and Japan remain heavily dependent on fossil fuels because of their easy availability and affordability.

While India has made significant progress in meeting its targets for 2030 committed in 2015 at Paris, realizing the higher 2021 targets committed at Glasgow, would depend on the availability of finance and technology to develop affordable energy substitutes for fossil fuels. India's massive developmental goals for the next 25 years, high growth potential, and welfare needs of the lower income group, especially in the rural sector, would continue to make large demands on funds and therefore compete for finance with the needs of non-fossil energy transition. Much of the investments in alternative energy in recent years have gone towards financing solar and wind power. Renewable Energy (RE) makes up 23 per cent of India's current energy capacity. While India has committed to enhance its non-fossil-energy capacity to 500 giga watts (GW) and meet half of its energy requirements through Renewables by 2030, the road to success in 2030 would demand a major national effort in many sectors.

Moreover, renewables alone cannot be the solution for the country's needs. Hydropower and nuclear power that provide stable and continuous supplies would have to be part of the new energy mix. It also needs to step up its development and production of green hydrogen and make it an affordable source of alternative energy. India is scaling up its hydropower production. It is planning to construct the country's second-largest dam at Yingkiong in Arunachal Pradesh, with a capacity to store 12.2 BCM of water. The central government has also sanctioned a series of projects on Ravi and Chenab in Jammu and Kashmir, among others.

Finally, India's success in achieving its climate targets demands international cooperation with other countries, for technology and investments needed for green development. Overcoming the challenges of achieving the COP-26 goals for 2030 and net zero by 2070 pose enormous policy, economic and technological challenges for the country. They also open-up huge opportunities for India's scientific, engineering, environmentalist, entrepreneurial talent to build a prosperous and green *Atmanirbhar Bharat*.

It is useful to underline here that while India faces significant climate challenges and must urgently improve its urban air quality, its per capita emission of greenhouse

gases (GHG) has so far been very low compared to the West and China. Till 2019, its cumulative carbon dioxide emission was 3 percent as against 47 percent by Europe and the US put together, though India's population is larger than the two combined. This is according to the latest Environment Performance Index, 2022. The GHG intensity of growth rate ranks India at 34 while the US is at 44 and Germany 48. It is ironical, therefore, that the EPI ranks India as the worst performer among 180 countries using controversial methodology, while placing most of the Western countries that have contributed the bulk of the GHG emission historically as being the best performers. India's carbon footprint has been extremely low so far. The developed West needs to recognise this and facilitate India's efforts to attain its long-term developmental goals and fulfil its significant climate commitments.

### **In this Issue**

This special Issue of *National Security* is devoted to understanding the challenges posed by climate change and the opportunities for building a sustainable alternative development path for India. Energy transition is at the heart of this mission.

In his opening essay that sets the tone for the other texts, Dr. Arvind Gupta expresses his disappointment at the limited achievements of the Glasgow COP-26 summit even as the world faces the threat of crossing what the Swedish scientist Johan Rockström called 'planetary boundaries'. There is genuine scepticism whether the developed countries are serious about reducing carbon dioxide emission since they failed to keep their promise of providing US dollar 100 billion per year to the developing world to meet the challenge of climate change. Without the necessary financial commitments for green development by the developed states the rest of the world would face scarcity of finance and technology for addressing the dual challenge, with serious consequences for attaining the COP-21 and COP-26 goals. He calls for a balanced and sensitive definition of what the crossing of 'planetary boundaries' entails so that just and equitable solutions that take into account the interests of the developing world can be found to mitigate climate change.

Bishow Parajuli in his essay draws attention to the triple crises of climate change, COVID-19 pandemic, and conflicts that are aggravating hunger and food insecurity among millions in the developing world. Given his long experience in the World Food Programme he is well-placed to survey the food situation. He points out that some 650

million people suffered from hunger and food scarcity in 2019, a year before Covid-19 struck. Since then the pandemic, and the more recent Ukraine conflict have only deepened this terrible humanitarian tragedy.

In his valuable contribution on India's ancient wisdom on sustainable development, Dr. T. V. Muralivallabhan dwells on India's rich cultural tradition in environmental protection. He traces this heritage to her holistic vision and integrated approach to the *Advaita* principle of *Vedanta* Philosophy. The oneness of nature ingrained in *Vedanta* philosophy and the maintenance of balance between human needs and the sustenance of nature makes it an ideal foundation for building an alternative model for development. India, he argues, could be the torchbearer for global efforts to achieve sustainable development if it moves away from the mechanistic growth models that have dominated global thinking on progress to the detriment of environment and natural balance that sustains life on earth.

Prof. Nitya Nanda in his lucidly written assessment of India achieving its INDC targets set at Paris and Glasgow, argues that in view of the impressive achievements in reducing emission intensity, enhancing renewable energy capacity, and expanding forest cover, the country is well placed to achieve the 2015 targets. However, achieving the higher Glasgow commitments would be possible only if substantial finances and new technologies become available. He argues that for India, 'living up to its commitment will not only be determined by its own internal factors and challenges but also by how other major countries perform on their mitigation commitments'.

PK Khup Hangzo makes an excellent case for India enhancing its hydropower production for meeting the non-fossil fuel challenge. He argues that the current focus on enhancing wind and solar power as non-fossil alternatives needs adjustment since both provide intermittent supplies. The ability of hydropower 'to integrate large shares of variable and intermittent renewable energy sources, such as solar and wind, in the country's electricity system is increasingly important' as the penetration of renewables increase. India has large hydropower potential and these need to be urgently tapped by drawing up better environmental protection and rehabilitation plans. Hydropower projects can also help India 'consolidate its administration in the remote border regions, and strengthen its security and defence preparedness' in border-States such as Arunachal Pradesh.

In her analysis of India's water stress and the deficiencies in quantity and quality, young scholar Heena Samant covers an important theme. Drawing on the NITI Aayog's 2018 and 2019 reports that capture the grave water related challenges confronting the country, she argues that past policies, less than adequate attention, and governance issues have been important reasons for the situation. Rising population, rapid urbanisation, industrial growth and demands of agriculture, along with inadequate water governance are responsible for the plight. However, major reforms and initiatives by the present government are significantly changing the situation and enabling the country to overcome water related challenges. She calls for greater preparedness and public awareness regarding water as climate change continues to pose many unanticipated challenges.

In the regular Africa Watch segment, scholar Samir Bhattacharya draws attention to the ongoing civil conflict in the important West African state of Mali. He compares the current situation with the end game in Afghanistan and argues that the international community needs to avoid the mistakes the US made in its war against terror and the Taliban. The rise of Islamic extremism and separatism in Mali threatens to unravel the African nation with wide regional implications. It needs positive international engagement with the parties to resolve the conflict, and assistance to strengthen governance, and security capacities of the state.

This issue also carries a report on a new climate study and a Book Review. Scholar Dr. Garima Maheshwari presents some of the findings of a new Indo-Dutch collaborative study on climate security in the Bay of Bengal. She is one of the authors of the study and her brief survey of climate induced conflicts in the region adds value. Young scholar HIRAK J. DAS reviews an important new survey of the emerging political situation in the Arab world, its aspirations, conflicts, and possible future. It opens up a window to an improved understanding of political dynamics in a crucial neighbouring region.

It is hoped that the issue will make a significant contribution to the increasingly vital field of climate change and energy transition, and lead to a better appreciation of the challenges faced by India and its policies. .

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