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## **CLIMATIC CHANGES AND ENVIRONMENTAL ISSUES IN INDIAN CONTEXT**

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**ABSTRACT** Climate change is disturbing the natural and ecosystems and is expected to have substantial adverse effects in India, mainly on agriculture (on which 58% of the population still depends for livelihood), water storage in Himalayan glaciated which are the source of major rivers and groundwater recharge, sea-level rise, and threats to a long coastline and habitations. Climate change will also cause increased frequency of extreme event such as floods and droughts. These in turn will impact India's food security problems and water security. As per the Second National Communication submitted by India to the UNSFCC, it is projected that the annual mean surface air temperature rise by the end of the century ranges from 3.5<sup>o</sup>C to 4.3<sup>o</sup>C, where as the sea level along the Indian coast has been rising at the rate of about 1.3 mm/year an average. These climate change projections are likely to impact human health, agriculture, water resources, natural ecosystems and biodiversity. Concerned of the threats imposed by climate change and pressures on natural resources, sustainability & environment are increasingly taking centre stage in the Indian policy domain. India has been part of 94 multilateral environmental agreements. India has also voluntarily agreed to reduce its emission intensity of its GDP by 20-25% over 2005 levels by 2020 & emissions from the agriculture sector would not form part of the assessment of its emissions intensity. Indian economy is already moving along a lower carbon and sustainable path in terms of declining carbon intensity of its GDP which is expected to fall further through lower carbon strategies. It is estimated that india's per capita emission in 2031 will still be lower than the global per capita emission in 2005 (in 2031, India's per capita GHG emissions will be under 4 tonnes of carbon dioxide equivalent (CO<sub>2</sub> eq.) which is lower than the global per capita emissions of 4.22 tonnes of CO<sub>2</sub> eq. in 2005).

**KEYWORD:** Sustainable: जीवन धारण करने योग्य, Climate: जलवायु, Change: परिवर्तन, Crop: फसल, Food: खाद्य, Security: सुरक्षा

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### **INTRODUCTION**

In the past two decades, the key environmental challenges in India have been sharper. The State of Environment Report by the Ministry of E.F. clubs the issues under five key challenges faced by India- (1) Climate Change, (2) Food Security, Water Security, (3) Energy Security and (5) Managing Urbanisation.

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Climate change is disturbing the natural and ecosystems and is expected to have substantial adverse effects in India, mainly on agriculture (on which 58% of the population still depends for livelihood), water storage in Himalayan glaciated areas which are the source of major rivers and groundwater recharge, sea-level rise, and threats to a long coastline and habitations. Climate change will also cause increased frequency of extreme events such as floods and droughts. These in turn will impact India's food security problems and water security. As per the Second National Communication submitted by India to the UNSFCCC, it is projected that the annual mean surface air temperature rise by the end of the century ranges from 3.5°C to 4.3°C, whereas the sea level along the Indian coast has been rising at the rate of about 1.3 mm/year on average. These climate change projections are likely to impact human health, agriculture, water resources, natural ecosystems and biodiversity<sup>1</sup>. Concerned of the threats imposed by climate change and pressures on natural resources, sustainability & environment are increasingly taking centre stage in the Indian policy domain. India has been part of 94 multilateral environmental agreements. India has also voluntarily agreed to reduce its emission intensity of its GDP by 20-25% over 2005 levels by 2020 & emissions from the agriculture sector would not form part of the assessment of its emissions intensity. Indian economy is already moving along a lower carbon and sustainable path in terms of declining carbon intensity of its GDP which is expected to fall further through lower carbon strategies. It is estimated that India's per capita emission in 2031 will still be lower than the global per capita emission in 2005 (in 2031, India's per capita GHG emissions will be under 4 tonnes of carbon dioxide equivalent (CO<sub>2</sub> eq.) which is lower than the global per capita emissions of 4.22 tonnes of CO<sub>2</sub> eq. in 2005).

Together with the national efforts in different sectors, India also recognizes that rural areas are equally prone to stress and pressures from natural resource exploitation. In this context, schemes for rural development and livelihood programmes are very relevant. A vast majority of the works under the Mahatma Gandhi National Rural Employment Guarantee Scheme are linked to land, soil and water. There are also programmes for non-timber forest produce-based livelihood, promotion of organic and low chemical agriculture, and increased soil health and fertility to sustain agriculture-based livelihood. These schemes help mobilise and develop capacities of community institutions to utilise natural resources in a sustainable manner and their potential can be further developed<sup>2</sup>. Along with efforts to incorporate sustainability in the rural development process, India is increasingly making effort to integrate the three pillars of sustainable development into the national policy space. In fact, environment protection is enshrined in our Constitution (Article 48A and 51A). Various policy measures are being implemented across the domains forestry, pollution control, water management, clean energy and marine and coastal environment. Some of these are policies like joint Forest Management, Green Rating for Integrated Habitat Assessment, Coastal Zone Regulation Zone, Eco Labelling and Energy Efficiency Labelling. Fuel Levelling organisational structure has been developed for environment protection. The INDCs (Intended Nationally Determined Contributions) are plans by Governments communicated to the UNFCCC regarding the steps they will take to address climate change domestically. As per the COP 19 decision (Warsaw 2013), all parties were requested to prepare their INDCs, without prejudice to the legal nature of the contributions towards achieving the objectives of the convention and communicate well in advance of COP 21. India submitted its INDC to the UNFCCC by early October 2015. It is comprehensive and covers all elements, i.e. adaptation, mitigation, finance, technology and capacity building, India's goal is to reduce the overall emission intensity and improve the energy efficiency of the economy over time. It also covers concerns to protect the vulnerable sectors and segments of its society. The highlights of India's INDC are given below<sup>3</sup>:

1. To put forward and further propagate a healthy and sustainable way of living based on traditions and values of conservation and moderation.
2. To adopt a climate friendly and cleaner path than one hitherto followed by others at a corresponding level of economic development.
3. To reduce the emissions intensity of its GDP by 33 to 35% of the 2005 level by 2030.

4. To achieve about 40% 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 the Green Climate Fund (GCF).
5. To create an additional carbon sink of 2.5 to 3 billion tonnes of CO<sub>2</sub> equivalent through additional forest and tree cover by 2030.
6. To better adapt to climate change by enhancing investments in development programmes in sectors vulnerable to climate change, particularly agriculture, water resources, the Himalayan region, health and disaster management.
7. To mobilize domestic and new and additional funds from development countries for implementing these mitigation and adaptation actions in view of resource gap.
8. To build capacities, create a domestic framework and an international architecture for quick diffusion of cutting-edge climate technology in India and for joint collaborative R&D for such future technologies.

India houses 30% of the global poor, 24% of global population without access to electricity and 92 million people without access to safe drinking water, coupled with its vulnerability in terms of the impact of climate change, this entails that India faces formidable and complex challenges in terms of balancing the sustainable development agenda. Given the challenges it faces, it has prepared an ambitious plan in terms of clean energy, energy efficiency and lower emission intensity while addressing the critical issues of poverty and food security-

1. India's INDC sets ambitious renewable energy targets mainly in terms of solar & wind energy. With a potential of more than 100 GW, the target is to achieve 60 GW of wind power and 100 GW of solar power installed capacity by 2022. Given that in 2014 the world entire installed solar power capacity was 181 GW, this target is extremely ambitious and clearly places India as a major potential renewable energy player (World Report Institute, October 2015).
2. India has also launched a historic International Solar Alliance (ISA) which is envisaged as a coalition of solar resources-rich countries to address their special energy needs and will provide a platform to collaborate on addressing the identified gaps through a common, agreed approach.
3. Although there is lot of emphasis on boosting the renewable energy sector, the INDC clearly states that coal would continue to be the dominant source of power generation of the future. However, the INDC incorporates a lot of initiatives to improve the efficiency of coal-based power plants and to reduce their carbon footprint. Clean coal technologies would be critical to meeting the demand for power generation in the future.
4. In addition to mitigation-related activities the INDC also incorporates adaptation-related activities. Out of the 8 National Missions on Climate Change in India, 5 focus on adaptation in sectors like agriculture, water and forestry.

Mobilising finance is critical to achieving the ambitious targets set by India. Preliminary estimates suggest that at least US\$ 2.5 trillion (at 2014-15 prices) will be required for meeting India's climate change action under the INDC between now and 2030. While the maximum share of the country's current climate finance comes from budgetary sources, India is not relying solely on them and is experimenting with a careful mix of market mechanisms together with fiscal instruments and regulatory intervention. However, it needs to be emphasized that international finance is a critical enabler for the scaled up climate action plans. India's concerns and actions toward climate change appear in policies by early 1997 itself when it officially accepted the idea of sustainable development. Since then, several sectoral initiatives have been taken by the country. By 2008, India had launched its eight national mission on climate change. Over the time, India has not only played a very dynamic role at the international level but it has also taken appreciable domestic effort in this direction<sup>4</sup>-

**NAPCC:** A major component of India's domestic action against climate change is the National Action Plan on Climate Change (NAPCC). In March 2016, the PM's Council of Climate Change (PMCCC) directed the missions under the NAPCC to enhance their ambitions in respect of adaptation, mitigation

and capacity building reprioritize them, besides recommending the setting up some of new missions in addition to the existing eight:

1. Considering the adverse impacts that climate change could have on health, a new 'Mission on Climate Change And Health' is currently under formulation and National Expert Group on Climate Change & Health has been constituted.
2. The proposal 'Waste to Energy Mission' will incentivize effort towards harnessing energy from waste and is aimed at lowering India's dependence on coal, oil and gas for power production.
3. The 'National Mission on Coastal Areas' (NMCA) will prepare an integrated coastal resource management plan and map vulnerabilities along the entire (nearly 7000-km-long) shoreline.
4. The 'Wind Mission' seeks to increase the share of wind energy in the renewable energy mix of india. It is likely to be given an initial target of producing about 50000-60000 MW of power by the year 2022.

**SAPCC :** The State Action Plan on Climate Change aim to create institutional capacities and implement sectoral activities to address climate change. These plans are focused on adaptation with mitigation as co-benefit in sectors such as water, agriculture, tourism, forestry, transport, habitat and energy. So far, 28 state and 5 union territories (UTs) have submitted their SAPCCs to the MoEF & CC (Ministry of Environment & Climate Change). Out of these, the SAPCCs of 32 states and UTs have been endorsed by the National Steering Committee on Climate Change (NSCCC) at the MoEF&CC.

**NAFCC :** A National Adaptation Fund for Climate Change has been established with a budget provision of 1350 crore for the year of 2015-16 and 2016-17. It is meant to assist in meeting the cost of national and state-level adaptation measures in areas that are particularly vulnerable to the adverse effects of climate change. The overall aim of the fund is to support concrete adaptation activities that reduce the adverse effects of climate change facing communities, sectors and state but are not covered under the ongoing scheme of state and central government. The adaptation project contribute towards reducing the risk of vulnerability at community and sector level.

**Coal Cess and National Clean Energy Fund :** India is one of the few countries around the world to have a carbon tax in the form of a cess on coal. Not only has India imposed such a cess but it has also been progressively increasing it (from Rs. 50/tonne of 2010 to Rs.200 by 2015-16). The NCEF which is supported by the cess on coal was created for the purposes of financing & promoting clean energy initiatives, funding research in the area of clean energy & any other related activities.

**PAT :** The Perform Achieve and Trade scheme under the National Mission on Enhanced Energy Efficiency was introduced as an instrument for reducing specific energy consumption in energy-intensive industries with a market-based mechanism that allowed the trading of ESCerts (energy saving certificates). The ESCerts, issued by the Gol, are traded through the power exchanges in the country.

**Renewable Energy :** For India renewable Energy has become major focus area. The Gol has set an ambitious target of achieving 40% cumulative electric capacity from non-fossil fuel-based energy resources by 2030. India is currently undertaking the largest renewable capacity expansion programme in the world.

**OUTLOOK FOR THE FUTURE** The year 2015 has been commendable regarding world's action towards environmental protection & climate change. We see the world agree to a common framework on climate change and a set of SDGs in a single year was indeed a monumental achievement in this regard there will two important challenges<sup>5</sup> in front of the world-

- 1 Mobilization of the funds needed for releasing the bold targets envisaged under both.
- 2 Need of a Clear action plan for implementation.

Budgetary sources of the countries (especially, in case of developing countries) will not be sufficient enough for the successful implementation of the Paris Agreement, the SDGs and the ambitious targets set out in the INDCs. Looking at the size of funds which will be needed to release these goals, the experts have advised to mobilize at channels in this regard-private finance, public finance-both national and international.

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**CONCLUSION:** Hardly anything make economic sense unless its continuance for a long time can be projected without running into absurdities. Growth and development can happen to a 'limited objective', but it cannot be stretched up to an 'unlimited extent'. How can be 'finite' earth support mankind's 'infinite' physical needs?--long before this was postulated by the 'Club of Rome' in 1972, exactly the same thing Gandhiji had said in late thirties itself, 'Earth provides enough to satisfy every man's need, but not for every man's greed. Mankind need to introspect not for only about its present needs but the way those needs are being met. Beside we also need to 'differentiate' between our 'needs' and 'aspirations'. Out physical needs have a direct 'link with the resources we have at our disposal to meet them. If mankind is to survive and prosper, we need to be aware of the repercussions of our ctivities on Mother Nature.<sup>6</sup>

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