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India's Clean Energy Transition through the COP- 21 Perspective: Issues and Challenges

SHREYA SAXENA[1]

ABSTRACT

India possesses one of the most diversified energy sectors globally. Power generation in India includes traditional sources, such as coal, natural gas, oil, and hydro, to less mainstream sources, such as wind, solar, and agricultural and domestic waste. The growing environmental concerns coupled with an increasing energy demand are creating conflicting challenges for the power sector. Conventional sources of energy cause harm to the environment and are fast depleting. In the contemporary world, there is a need to reconcile economic development and environmental sustainability and tap into sources of clean energy.

Lack of access to clean energy leads to a daily struggle for mere sustenance, thereby digressing from economically rewarding pursuits. Consequently, the same hampers economic development; it also affects the environment and health of the population. In this background, the project seeks to discuss the right to access clean energy from a Constitutional perspective. It evaluates the right to clean energy against the touchstone of fundamental rights and analyses its importance in realizing other fundamental and constitutional rights.

Environmental degradation is a significant causal factor in perpetuating poverty globally. The United Nations Framework Convention on Climate Change (UNFCCC) reached a historic agreement to combat climate change and unleash action and investment towards a low carbon and sustainable future, popularly known as the Paris Agreement (COP 21), which India ratified. The project seeks to analyze India's position in combating climate change and promoting economic development while comprehensively examining India's policy changes post-COP -21 and challenges to renewable energy access.

Keywords: *COP- 21, Right to access energy, Renewable Energy, Environment.*

I. INTRODUCTION

Access to modern energy is essential for holistic development of an individual. The access to energy ensures access to basic amenities of food, water and shelter. Its importance in true realization of access to education and health care also cannot be undermined. A stepping stone

[1] Author is an Advocate at Supreme Court of India, India.

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to attaining human development goals, the right to energy access and poverty are inextricably intertwined, where low income leads to further inaccessibility to clean, affordable energy. The unsafe access to energy further increases economic and social deprivation. [2] It is essential for realization of present day objectives of growth and development that such right to access energy be combined with sustainable development goals which focus on energy conservation and mitigating climate change.

Presently non renewable sources such as coal, natural gas and oil constitute the primary sources of energy worldwide. They pose various environmental problems including global warming, loss of forest cover and industrial air pollution due to ever increasing concrete jungles.[3] Around 770 million across Asia and Africa lack accessibility to electricity while 2.5 billion languish without clean cooking fuel and the pandemic has further deteriorated the situation.[4]

Globally rising energy demands coupled with growing environmental concerns are creating conflicting challenges for the power sector. Conventional sources of energy cause harm to the environment and are fast depleting. In the contemporary world, there is a need to reconcile economic development and environmental sustainability and tap into sources of clean energy. In this background the paper seeks to study whether right to access clean energy falls within the scope of a 'fundamental right' under the Indian Constitution.

The need to mitigate the ill-effects of climate change and environmental degradation and to promote sustainable development, by mobilizing joint action on the international front was recognized. One hundred ninety five nations on December 12, 2015 acquiesced to an agreement known as the Paris Agreement on Climate Change or COP-21. It is a significant international agreement between parties to the UN Framework on Climate Change (UNFCCC), aiming towards combating climate change, decarbonisation and promoting sustainable development. The main intent behind the Paris Agreement is to ensure maintenance of the global average temperature beneath 2 degree Celsius and to make further efforts to bring the temperature to 1.5 degree celsius above pre industrial levels. Ratification of the Agreement was made by India on October 2, 2016. Under the COP-19, the concept of Intended Nationally Determined Contributions (INDCs) was evolved. Parties were invited to put forward their INDC before the 21st session of the Conference of Parties commenced. These INDCs laid down the future course

[2] Abhishek Jain and Tauseef Shahidi *Guiding Action: A User Centric Approach to Define, Measure, and Manage Electricity Access* 8 *ECONOMICS OF ENERGY & ENVIRONMENTAL POLICY* 19-32 (2019).
[3] World Commission on Environment and Development, *Our Common Future*, ¶176, U.N. Doc. A/42/427 (1987).
[4] INTERNATIONAL ENERGY AGENCY (IEA) *World Energy Outlook 2021* October 13, 2021, 175-178, available at: https://www.oecd-ilibrary.org/energy/world-energy-outlook-2021_14fcb638-en (last accessed: November 7, 2021)

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of action a State would adopt to fulfill obligations under the Paris Agreement. The present paper also seeks to examine India's progress in fulfilling the obligations under the COP- 21 and traces the schemes and policy changes introduced to achieve the same. It also briefly touches upon the challenges to realization of the obligations undertaken as per the Paris Agreement.[5]

II. RIGHT TO ACCESS CLEAN ENERGY- WHETHER A FUNDAMENTAL RIGHT

International importance was first accorded to clean energy as a component of sustainable development in the Brundtland Report.[6] World Energy Assessment highlighted the lack of access of energy to a large part of the world's population and its role in perpetrating the vicious circle of poverty and deprivation. The report also highlighted environmental hazards of non-renewable sources of energy. In the present society, clean energy no longer remains a luxury. It is essential for socio-economic development and environmental sustenance. Agenda 21 reiterates the same and calls for use of energy resources in a manner respectful to the atmosphere, human health and environment.[7] In *M. Nagaraj*, the Court observed that fundamental rights are not gifts bestowed upon the citizens by the State. Fundamental rights were envisaged as inherent rights possessed independent of the Constitution, by virtue of being members of the human race.[8]

Article 21 of the Constitution of India provides that that "no person shall be deprived of his life and personal liberty except according to procedure established by law".[9] Article 21 is of wide import and has been interpreted purposely by Indian Courts so as to include many other rights within the ambit of "life and personal liberty". In *Francis Coralie Mullin v. The Administrator, Union Territory of Delhi*, the Supreme Court while interpreting right to life, held that court should not construe the same in a restricted manner, and should take into account changing circumstances. Interpreting the right to life, it held that such right does not amount to mere animal like existence. It includes the right to live with dignity, with access to necessaries such as food, clothing, and shelter, facilities for reading and writing as well as interacting with fellow individuals. [10]

Similarly, in the case of *Chameli Singh v. State of Uttar Pradesh*, the Court while touching upon

[5] PK Lakshmanan et al. *Paris Agreement on Climate Change and India* 3 JOURNAL OF CLIMATE CHANGE 2-3 (2017) available at: http://content.iospress.com/journals/journal-of-climate-change/3/1 **(last accessed: November 23, 2021)**

[6] Sanjit Kumar Chakraborty, *The 'Fundamental' Right to Access Energy: Issues, Opportunities and Challenges in India* in ENERGY LAW AND POLICY (NLSIU Book Series-2) 9-12 (2016)

[7] Uday Shankar and Surendra Sharma, *Access to Energy: Looking through the Prism of Human Rights – Indian experience* 38 THE JOURNAL OF ENERGY LAW AND DEVELOPMENT 221-240 (2013)

[8] M. Nagraj v. Union of India (2006) 8 SCC 212

[9] The Constitution of India, 1950, Art.21.

[10] (1981) 1 SCC 608

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the rights under the UDHR and the ICESCR, 1966 emphasized on the right of every human being to have an adequate standard of living including adequate food, shelter, clothing, medical care etc.[11] [12] K. Ramaswamy, J. held that sufficiency of space, safety of accommodation, clean surroundings, and adequate provision of light, water and ventilation and accessibility to amenities like sanitation, electricity and connectivity through roads constitutes the Right to shelter.[13] In K.*N. Raveendranadhan v. Kerala State Electricity Board and Ors.* the Madras High Court held water and electricity to be an integral part of the right to life under Article 21.[14]

In *Hindustan Zinc Ltd. v. Rajasthan Electricity Regulatory Commission*, the validity of the RERC (Renewable Energy Obligation) Regulations, 2007 was in question since it imposed Renewable Energy obligations upon Captive Power Plants. The Appellants pleaded that the same was *ultra vires* by virtue of being in contravention of Article 14 and 19(1) (g). The Court held that such Regulations were in consonance with the mandate of the Constitution under Article 48- A read with fundamental duties enshrined in Article 51A (g) which obligates the State to protect the Environment. Acknowledging that the National Action Plan on Climate Change and India's obligations under the Kyoto Protocol, the Supreme Court held that promotion of such environmentally benign policy which promoted green energy fell within the purview of right to life under Article 21 coupled with Article 51(1)(g).[15]

Article 39(a) provides that State shall direct its policy towards ensuring livelihood for its citizens. Energy is an essential means of attaining livelihood. The right to livelihood has been recognized by the Courts as a part of Article 21.[16] Similarly, energy serves as an essential means to meaningfully exercise the right to education, a fundamental right guaranteed under Article 21-A, further strengthened by directives under Article 39(f) to ensure that the children are given opportunities and facilities to develop in healthy manner.

In gaining access to healthcare, in consonance with the mandate of the Constitution under Article 39(e) which protects against abuse of health and strength, energy accessibility plays a major role.[17]In the case of *Virender Gaur v. State of Haryana*, the Supreme Court highlighted that it is not only the duty of the State, but also duty of every citizen to maintain a healthy

[11] Article 25, Universal Declaration of Human Rights, G.A. res. 217A (III), U.N. Doc A/810 at 71 (1948).
[12] Article 11, International Covenant on Civil and Political Rights, G.A. res. 2200A (XXI), 21 U.N. GAOR Supp. (No. 16) at 52, U.N. Doc. A/6316 (1966), 999 U.N.T.S. 171, *entered into force* Mar. 23, 1976.
[13] (1996) 2 SCC 549.
[14] (2021) 2 KLT 669.
[15] 2015 (12) SCC 611.
[16] *Olga Tellis v. Bombay Municipal Corporation* 1985 SCC (3) 545.
[17] SHANKAR AND SHARMA, *supra* note 6.

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environment. Article 21 encompasses within it the right to live with human dignity. The attainment of the same requires protection and preservation of environment, ecological balance free from pollution of air and water, sanitation.[18] Without recognizing the right to access clean energy as a fundamental right, it is difficult to meaningfully realize true potential of other rights enshrined in the Constitution.

In *T.M. Prakash and Ors. v. The District Collector and The Superintending Engineer, Tamil Nadu Electricity Board* the Madras High Court observed that electricity supply acts as a determinative factor, which weighs in on education, health etc. and the lack of it perpetrates inequality in the society and aggravates economic disparity. Pointing out that children lose out on educational opportunities and women's health has to suffer due to reliance on traditional modes of cooking involving firewood and smoke, the Court noted that when right to education is a fundamental right, and so is the right to health as a part of the right to life, then access to electricity supply should also be considered a fundamental right in itself. Lack of electricity denies a person equal opportunity in matters of education and consequently affects employment, health, sanitation and other socio-economic rights. Without the same, Constitutional objectives of equality, fraternity and liberty remain to be mere words.[19] Without recognizing the right to access clean energy as a fundamental right, it is difficult to meaningfully realize true potential of other rights enshrined in the Constitution of India and other international instruments. Therefore, this presents a fit case for the recognition of Right to access energy as a fundamental right.

III. THE PARIS AGREEMENT AND INDIA'S INDCS - AN OVERVIEW

A significant international agreement between parties to the UN Framework on Climate Change (UNFCCC), aiming towards combating climate change, decarbonisation and promoting sustainable development, the Conference of Parties (COP-21) was materialized among 195 Nations at Paris on 12 December, 2015. With an objective of maintaining the global average temperature to well below 2 degree Celsius and to make further efforts to bring the temperature to 1.5 degree Celsius above pre industrial levels, incorporating transition to clean energy and achieve peaking of Green House Gas emissions, the agreement so brought about was ratified by India in 2016. Under the COP-19, the concept of INDCs was evolved. Parties were invited to put forward their INDC before the 21st session of the Conference of Parties commenced. These INDCs laid down the future course of action a State would adopt to fulfill obligations

[18] (1995) 2 SCC 577.
[19] (2014) 1 MLJ 261.

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under the Paris Agreement and ought to be reviewed every five years, improving upon their past contributions.[20]Another key feature to the Agreement is the principle of "Common but Differentiated responsibilities". It means that instead of differentiating between the developed and developing countries, the agreement sets out common goals for all to pursue. The agreement also commits finances and technical support to developing nations in order to achieve realization of their respective NDCs.[21]

India's INDCs are based on developing policies and programmes which encourage clean energy and intensify energy efficiency, equip urban centres to produce low carbon emissions, sustainable eco-friendly transportation, promotion of waste to wealth, reduction of pollution and growth of carbon sink. It seeks to include citizens and private organizations to contribute towards climate change.[22]

Broadly put, India's INDC conveys 3 major time-bound objectives which were to be completed within 2030:

1. To increase reliance upon non – fossil fuels in total power generation capacity upto 40%.
2. Emission intensity(GHG emission per unit of GDP) reduction by 33-35%
3. Increase forest cover (carbon sink) so as to absorb 2.5- 3 tonnes of carbon dioxide emissions.[23]

While recognizing the importance of universal energy access, the INDC provides for a bidirectional approach, which aims at fulfilling energy needs of the population on one hand, while reducing carbon emissions on the other, through generation of renewable energy through solar and wind power, and introducing technologies to reduce emissions in case of coal based power. For promoting energy efficiency, introduction of innovative programmes was also stipulated.[24]

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[20] Paris Agreement to the United Nations Framework Convention on Climate Change, Dec. 12, 2015, T.I.A.S. No. 16-1104.

[21] Department of Economic Affairs, Ministry of Finance, Government of India, *Report of the Sub-Committee for the Assessment of the Financial Requirements for Implementing India's Nationally Determined Contribution (NDC)*, 4 (June 2020) available at: https://dea.gov.in/sites/default/files/Sub%20Committee%20Report%20Final.pdf (last accessed: November 27, 2021)

[22] Press Release, MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE, October 2, 2015, available at: https://pib.gov.in/newsite/printrelease.aspx?relid=128403 (last accessed: November 21, 2021).

[23] Urmi Goswami, *India to achieve climate goals before schedule: Environment Minister Harsh Vardhan* ECONOMIC TIMES Dec 03, 2018, available at: https://economictimes.indiatimes.com/news/politics-and-nation/india-set-to-increase-share-of-renewables-and-reduce-carbo-dioxide-pollution/articleshow/66924213.cms (last accessed: November 21, 2021)

[24] UNFCCC, *India's Intended Nationally Determined Contribution* September 25, 2015, available at: https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/India%20First/INDIA%20INDC%20TO%20UNFCCC.pdf (last accessed: November 21, 2021)

IV. POLICY CHANGES AFTER COP -21

India's National Action Plan on Climate Change (NAPCC) paves the way for attainment of goals under the Paris Agreement. Initially brought in 2008, with 8 missions aimed at reducing the pace of climate change, the Plan underwent updation post the Paris Agreement, wherein four new missions were added to widen India's action plan against climate change. The Plan promotes sustainable development and broadening energy access, and supports clean energy transition. It lays a foundation to achieving goals set out under the Paris Agreement.[25] In order to evaluate policy changes and programmes incorporated to achieve the time bound objectives of COP 21, developments made so far are sectioned as per the major objectives they seek to achieve as follows:

(A) Transition to renewable energy

After the COP-21, India has worked heavily upon energy transition, and is operating world's largest capacity expansion programmes with respect to renewable energy.[26] According to Ministry of Power, New and Renewable Energy India has achieved installation and operationalisation of 100GW of power capacity, while 50 GW installation is underway and 27 GW is undergoing tendering process. At present, 38.5% of India's total power generation capacity comes from renewable sources, this when juxtaposed against NDC shows that India is already on the verge of achieving the target set out for 2030. Under the INDC committed at the Paris Agreement, a target of installed renewable energy capacity of 175 MW was determined, constituted by 100GW- solar, 60 W- wind, 10 GW -bio-power and 5 GW -small hydro power.[27] Steadily moving towards energy transitions and realizing the vast potential for renewable energy generation, India has advanced its target from 175 GW to 450 GW of renewable energy capacity by 2030.[28]

Additionally Green Energy Corridors Project is being implemented. Aimed at seamless transmission of renewable energy, the Scheme shall support large scale energy evacuations from renewable energy rich states; it shall also resolve the issue of voltage fluctuations and allow smooth electricity supply.[29] The Scheme has two components: the inter- state transmission

[25] Anjali Jaiswal & Madhura Joshi, Climate Action: All Eyes on India**,** NRDC, December 12, 2020 available at: https://www.nrdc.org/experts/anjali-jaiswal/climate-action-all-eyes-india (last accessed:November 24, 2021)
[26] *Id.*, 23.
[27] Press Release, MINISTRY OF NEW AND RENEWABLE ENERGY, December 10, 2018, available at: https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1555373 (Last accessed: November 23, 2021).
[28]Press Release, MINISTRY OF NEW AND RENEWABLE ENERGY, August 25, 2021, available at: https://pib.gov.in/PressReleasePage.aspx?PRID=1748814 (Last accessed: November 23, 2021).
[29] Ministry of New and Renewable Energy, *Green Energy Corridors*, **December 31, 2019, available at**: https://mnre.gov.in/green-energy-corridor/ **(last accessed: November 23, 2021)**

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system and the intra- state transmission system, of which the inter- state component was completed in March 2020. The intra- state component was sanctioned, and once completed, it will provide for evacuation of 20,000 MW of renewable energy from renewable energy rich states. [30] The National Smart Grid Mission was also developed in order to monitor the implementation of policies pertaining to smart grids, in order to supply electricity to consumers while preventing dissipation of energy.[31]

In keeping with energy transition objectives, the Government has taken measures to carry out retirement of polluting thermal power plants in a phased manner as well.[32] 56 thermal power plants have been shut down accordingly post 2015 for non- compliance of emission norms along with levy of environmental charge for such flouting.[33] Thermal installed capacity has reduced from 70% to 61% over a period of five years 2015 onwards.[34]

The National Solar Mission, within the NAPCC, is aiming at incorporating 100 GW solar power by 2022.[35] Additionally, India offers world's lowest solar tariffs. Recognizing that establishing individual solar power projects may cause considerable delay in acquisition of land, and other clearances and laying down necessary infrastructure for transmission which would not be economical, the Government also came up with the Ultra Mega Renewable Energy Parks incorporating plug and play model under the Mission.[36] This model is efficient since it allows individual solar plants to share common infra such as communication systems, transmission systems, access to water supply, roadway network etc. thus reducing costs. It will also help in mitigating transmission losses and saves the hassle of acquiring land clearance and further development. The installed capacity of the scheme has been updated from 20,000 MW (post COP-21) to 40,000 MW. [37] On the international front, India has also tied up with the Government of France, to develop the International Solar Alliance, which aims at reducing the burden on non renewable sources of energy, developing technology and increasing energy

[30] Ministry of New and Renewable Energy, *Annual Report* 2020-21, 1.
[31] *Supra* note 23.
[32] Press Release, MINISTRY OF NEW AND RENEWABLE ENERGY, March 25, 2021, available at: https://pib.gov.in/PressReleasePage.aspx?PRID=1707631 (Last accessed: November 21, 2021).
[33] LOK SABHA, *Pollution from Coal-based Power Plants*, Unstarred Question 2059, (30.07.2021), Question by Smt. Raksha Nikhil Khadse & Sh. Manoj Kotak, available at: http://164.100.24.220/loksabhaquestions/annex/176/AU2059.pdf (last accessed: November 23, 2021)
[34] *Supra* note 24.
[35] Han Chen & Madhura Joshi, The Road From Paris: India's Progress Towards Its Climate Pledge, NRDC, December 12, 2020 available at: https://www.nrdc.org/experts/anjali-jaiswal/climate-action-all-eyes-india (last accessed:November 24, 2021)
[36] Press Release, MINISTRY OF NEW AND RENEWABLE ENERGY, August 25, 2021, available at: https://pib.gov.in/PressReleasePage.aspx?PRID=1748814 (Last accessed: November 23, 2021).
[37] Ministry of New and Renewable Energy, Solar Schemes, available at: https://mnre.gov.in/solar/schemes (last accessed: November 23, 2021)

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access.[38]

(B) Emission intensity reduction

India has so far achieved a reduction of 28%, as compared to the benchmark of 33-35% from 2005 levels envisaged under the agreement. [39] To achieve the above India has relied on National Mission for Enhanced Energy Efficiency, within NAPCC. It sought to boost energy efficiency by bringing in Market reforms by pushing for energy efficient appliances in Industries, introduction of the Perform, Achieve and Trade (PAT) Scheme and others. The PAT Scheme promotes energy efficiency in the industrial sector, by setting targets to be achieved by energy intensive industries such as cement, aluminum and alkali industries etc. The industries which overachieve are granted energy saving certificates (ESCerts), which can be traded/ purchased by the industries which have not achieved their targets.[40] Apart from this, Zero Effect, Zero Defect (ZED) Scheme provides certification to medium and small scale industries on basis of productivity, optimum use of resources and emissions.[41]

Apart from the industrial sector, other reforms which were promoted were replacing incandescent bulbs with environment friendly CFLs and LEDs for street lighting. Norms regarding Energy efficiency were made for commercial buildings.[42] In the housing sector, reforms such as Design Guidelines for residential buildings were also introduced. Other measures include the Smart Cities Mission which seeks to develop 100 smart cities. Launched in 2015, the Scheme aims at evolving mechanisms for sustainable development through efficient use of resources, poverty reduction and employment generation while relying on new age technology. *Bachat Lamp Yojna* incentivizes the use of CFLs in households, in place of traditional bulbs. The *AMRUT Scheme* also aims at provision of basic infrastructure regarding water drainage and supply, and expansion of the green areas through adoption of energy efficient approach. Reliance upon strengthening public transport infra and growing the metro rail network, introduction of regulations regarding vehicular emissions has also been undertaken as a measure to mitigate emissions. In recognition of the low environmental costs and fuel efficiency of water transport the Government has brought about *Jal Marg Vikas Yojna* which promotes development of National Waterway- 1. The project is currently underway. [43]At this

[38] *Id.*,31.
[39] *Id.*,35.
[40] Press Release, MINISTRY OF POWER, June 08, 2021, available at: https://pib.gov.in/PressReleseDetailm.aspx?PRID=1725448 (Last accessed: November 26, 2021).
[41] *Supra* note 23.
[42] Gireesh Chandra Prasad *India's potential for Energy efficiency immense: Power Minister R.K. Singh* LIVEMINT June 22, 2018 available at: https://www.livemint.com/Industry/kL9e147NMJe25RQHLzVlXM/Indias-potential-for-energy-efficiency-immense-Power-minis.html (last accessed:November 21, 2021)
[43] *Supra* note 23.

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pace it is expected that India shall meet its emission reduction goals before 2030.[44]

(C) Carbon Sink Enhancement

With respect to increasing the carbon sink, India has not yet fulfilled its targets and seems to lag behind. To attain the same, reliance has been placed on initiatives like the Green India Mission (within NAPCC), which has the primary objective of protecting, restoring and enhancing India's green cover. Not just concerned with increasing forest cover, it also caters to improving the quality of forest cover and ecosystem services, combining new age technology with traditional knowledge. The mission also incorporates local community participation role in forest conservation, while ensuring employment, through convergence of Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and Compensatory Afforestation Fund Management and Planning Authority (CAMPA). [45] Under the Green Highways Policy, erection of green cover on sides of National Highways was envisioned with the aim of reconciling national highways development projects along with environmental interests, enabling such green banks to act as carbon sink and thus aid in reducing air pollution and dust generated from plying vehicles.[46] In pursuance of the Scheme, 19.37 million trees were planted over the period of 2016-2020. [47] Plantation alongside river banks was also initiated which adds not just to the carbon sink but also helps farmers by growing crops, thus adding to their income. With respect to banks of Ganges, plants with medicinal properties, herbs and crops like ginger, onion, *haldi* etc. are being harvested. Apart from that, the growing of such plantations shall help control soil erosion, aid the revival of wetlands and check ground water depletion.[48]

V. CHALLENGES AND RECOMMENDATIONS

It was observed that throughout the period of 2015-2017, the National Green Mission could not achieve the targets set out by 34%. Green cover could be implemented only upon 44,000 out of 67,000 hectares. Another lacuna noted was that the mission only aimed at increasing the green cover, without attention to the soil and climatic conditions. This is a major factor, because growing such trees will lead to usage of water resources and lead to destruction of the

[44] *Supra* note 22.
[45] *Supra* note 21.
[46] *Supra* note 21.
[47] Ministry of Environment, Forest and Climate Change, Government of India *India: Third Biennial Update Report to the United Nations Framework Convention on Climate Change* (February 20, 2021) 285 available at: https://unfccc.int/sites/default/files/resource/INDIA_%20BUR-3_20.02.2021_High.pdf (last accessed: November 28, 2021)
[48] Neha Shukla, *River banks made greener in Uttar Pradesh*, THE TIMES OF INDIA (August 20, 2020) available at: https://timesofindia.indiatimes.com/city/lucknow/river-banks-made-greener-in-uttar-pradesh/articleshow/77658863.cms (last accessed: November 28, 2021)

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biodiversity of such area and will ultimately be counterproductive.[49]

Another shortcoming within measures undertaken towards development of carbon sink is that there is an institution of plantations to grow the green cover; however such steps negate the difference between plantation and forests. While plantations are associated with commercial activities, forests on the other hand are an amalgamation of various vegetation including trees, which aid in preventing soil erosion and encouraging bio diversity and plantations cannot be their substitute.[50]

Another major obstacle towards achievement of the objectives under INDCs is the lack of finance for proper implementation of schemes and policies. With respect to adaptation and mitigation measures to be undertaken, it is essential that in the face of economic limitation of the developing countries, the developed countries fulfill their obligations regarding provision of financial assistance for effective implementation of the Paris Agreement. India is need of financial assistance, more so as a recovering economy having borne the brunt of COVID-19 pandemic which led to dissipation of scarce financial resources. [51]

VI. CONCLUSION

Energy access acts as a gateway to realization of several other rights. It opens a plethora of opportunities and helps in fulfillment of developmental goals. However, such right to access energy cannot be in dereliction of the environment, therefore *clean* energy transitions are need of the hour. Global warming, deforestation and increasing carbon emissions have led to severe environmental degradation resulting in climate change, ozone layer depletion and consequent increase in the Earth's temperature. Therefore, it is essential that economic development is reconciled with environment conservation. International consensus upon the same manifests itself as the Paris Agreement. As per its obligations under the agreement, India post 2015, has taken significant steps by shifting to renewable sources of energy and reduction of CO2 emissions, and is anticipated to achieve its targets beforehand. However, with respect to the third objective of increasing forest cover, a lot more remains to be done.

It is shown that there exists a problem of adequate funds with respect to implementation of

[49] Parliamentary Committee Report on Estimates, Sixteenth Lok Sabha, *Performance of the National Action Plan on Climate Change*, Thirtieth Report, ¶ 24, 13 December, 2018 available at: http://164.100.47.193/lsscommittee/Estimates/16_Estimates_30.pdf (last accessed: November 27, 2021)

[50] *Id.*,48.

[51] Department of Economic Affairs, Ministry of Finance, Government of India, *Report of the Sub-Committee for the Assessment of the Financial Requirements for Implementing India's Nationally Determined Contribution (NDC)*, 30, 31 (June 2020) available at: https://dea.gov.in/sites/default/files/Sub%20Committee%20Report%20Final.pdf (last accessed: November 27, 2021)

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schemes, and that India has not received adequate financial support as promised under the Agreement, a fact supported by Department of Economic Affairs' report. Moreover with respect to the schemes pertaining to green cover enhancement, implementation without understanding of the consequences and proper research is manifest. Without the elimination of these challenges, complete realization of right to access clean energy is an uphill task.

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