

Decarbonization Sustainability in India

Author

Umamaheshwari Chakilum

* Contact: Art of Living, Hyderabad, Telangana State, India - 500011, uma6408@gmail.com.

Acknowledgements

- With Gratitude and reverence, I dedicate this paper to of my Guru H.H. Sri Sir Ravishankar Ji a Global Humanitarian and a spiritual leader, founder of Art of Living Organization for the opportunity given to me to work as director projects in Sri Sri Institute of Agriculture sciences and Technology Trust, one of the Trust founded under the Aegis of Art of Living.
- I thank the Ministry of Agriculture and farmer's welfare Government of India, for awarding projects across the different agro climatic zones to study the challenges and nuances of Natural farming.
- My Sincere Thanks to the local teams in the states of Uttarakhand, Uttar Pradesh, Andhra Pradesh, Karnataka, Odisha, Gujarat and my Family for being supportive to pursue my passion.

Abstract.

INTRODUCTION AND OBJECTIVE:

Decarbonization sustainability refers to the process of reducing carbon emissions and transitioning to a low-carbon economy in order to mitigate climate change and achieve long-term environmental sustainability.

Indian Scenario:

The physical manifestations of climate change are increasingly visible across the globe, and India is not untouched. More than 75 percent of India's districts—home to 638 million people, or 1.4 times the population of the European Union (EU)—are categorised as hotspots.

Though India's emissions currently stand at a mere 1.8 tons CO₂e per capita (versus the United States at 14.7 and China at 7.6), it is still the world's third-largest emitter at 2.9 GtCO₂e

(4.9 percent of global emissions).² India has reduced its emissions intensity of GDP by 1.3 percent per annum over the last decade, somewhat decoupling emissions from GDP growth.¹⁴ However, this pace of intensity reduction is not quick enough:

Challenges of Decarbonization In India

Energy is at the heart of economic development and perhaps no country is more challenged than India as it strives to create a better life for its population of almost 1.4 billion people.

India is now committed to the energy transition of decarbonization and achieving a state of net zero emission. .

India has made remarkable progress in recent years. It now has the 5th largest solar and 4th largest wind power capacity in the world, with their total capacity being over 100 GW. Though the share of renewables in total electricity generation is now over 10%, more than 70% of the country's electricity is still generated by fossil fuels.

An accelerated pathway requires setting up the needed transition within this decade, and an additional 2.4% of [GDP](#) in investment, front-loaded, compared to what the report calls a “line-of-sight” (LoS) scenario based on existing and announced plans and policies.

A more pragmatic reason for choosing an accelerated pathway, of course, is that if there is slippage, the fall-back will not be disastrous.

The areas where green investments will be needed are dominated by the electric power, and transport sectors, accounting for 70%, with agriculture and industry making up another quarter. The technologies needed will include ones that are relatively mature, such as solar power

generation, but also many where there is considerable room for innovation and cost reduction, including batteries, green hydrogen, and carbon capture.

India has to grow in a world that can survive only by reducing greenhouse gas emissions to reduce global warming and damaging climate change.

In 2021 at COP26, India announced the highly ambitious goal of decarbonizing energy to 50% and achieving 500 GW of fossil fuel free generating capacity by 2030. This was a very large increase above its Paris commitments, far more than expected - INDIA'S NEW 2030 DECARBONIZATION TARGETS .

MAIN FINDINGS

This Paper discusses – Role of Sustainable Agriculture in decarbonization with case studies of demonstration of climate resilience in agriculture, judicious use of land, water, power and other resources thus achieving sustainable growth and decarbonization in India, with relevance to the ROADMAP TO INDIA'S 2030 DECARBONIZATION TARGET

Human activities such as the burning of oil, coal and gas, as well as deforestation are the primary cause of the increased carbon dioxide concentrations in the atmosphere.

The ultimate target is to achieve carbon neutrality, meaning a return to levels of CO₂ naturally present in the atmosphere prior to human intervention.

Forests, soil, oceans, the atmosphere, carbonate rocks and fossil fuels are important stores of carbon. Natural sinks for atmospheric CO₂ include **photosynthesis**, forests, oceans and freshwater bodies, fossil fuels and carbonate rocks.

Agriculture is one of the largest CHG emitters in India accounting for nearly 20% of the country's total GHG emissions. The emissions would only grow over the years as food demand increases. Total agricultural emissions in India are expected to increase from 585 MtCo₂e in 2019 to 650 MtCo₂e by 2030.

The agriculture sector, which is most vulnerable to climate change, is the bedrock of the Indian economy, accounting for 14% of the country's GDP, and 40% of its employment. It is estimated that by 2100, up to USD10 billion of annual losses are expected due to climate change, with yields of major crops decreasing up to 30%.

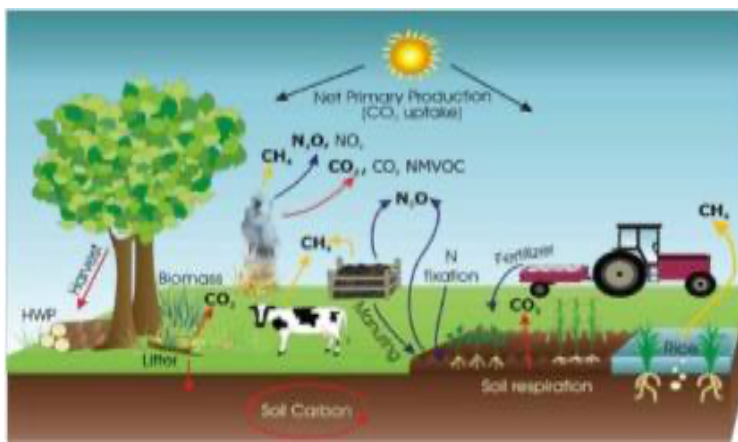
Therefore, a green transition in the agriculture sector becomes all the more important, but perhaps the most difficult one.

Forests have to be protected and expanded, water use for agriculture has to be dramatically improved—including changing agriculture methodologies from conventional to sustainable,

crop choices in many cases—and land use as a whole has to be planned much better, especially to accommodate new infrastructure for renewable energy sources. All of these actions would be socially beneficial even without the threat of climate change, but they will now be vital components of the decarbonization strategy.

Technological interventions alone could help cut over 75% of agricultural emissions. However, implementing such green interventions may require total capex spending of nearly USD240 billion by 2070.

The upside is that faster decarbonization of agriculture could lead to additional earnings of USD145 billion by 2070.



Method Adopted: Paper discusses first-hand experience in implementation of sustainable farming with results measured across the parameters, tested for climate resilience, judicious use of resources.

Research Deliverables

1. Expected reduction in the agricultural emission is 70% with the technology along with the knowledge to implement the methodology.
2. Addressing climate change with a strong new focus on more rational and strategic management of resources.
3. Indeed, environmental improvements by themselves might raise India's happiness index from its current lowly levels.

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Figure 1 - Heartwarming success story of how the AOL helped small farmers make big profits in drought-hit Kurnool (IBT, 2017)

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