UNDERSTANDING CARBON CREDITS AND OFFSETS IN INDIA

An Analysis of Key Mechanisms

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CAG
Citizen consumer and civic Action Group

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About CAG

Citizen consumer and civic Action Group (CAG) is a thirty eight year old non-profit, non-political and professional organisation that works towards protecting citizens' rights in consumer and environmental issues and promoting good governance processes including transparency, accountability and participatory decision-making.

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Executive Summary

Carbon trading is a mechanism that allows countries to trade carbon credits generated by the reduction or removal of greenhouse gas emissions from the atmosphere. Carbon markets help mobilise resources and reduce costs to give countries and companies the space to smooth the low-carbon transition. It is estimated that trading in carbon credits could reduce the cost of implementing Nationally Determined Contributions (NDCs) by more than half – by as much as $250 billion by 2030, equivalent to 25 thousand crore Indian rupees. In this analysis, we examine key carbon offset mechanisms and practices implemented in India. While these initiatives have claimed to reduce greenhouse gas emissions and promote sustainable development, they face challenges related to governance, transparency, and effectiveness. Recommendations include enhancing governance and transparency, prioritising community engagement, adopting holistic approaches in afforestation and reforestation, rigorous impact assessments, continuous monitoring, strengthening legal frameworks, and capacity building. However,recent analysis suggests that over 90% of rainforest carbon offsets, certified by the largest certifier, are ineffective. This underscores the importance of prioritising direct emission reduction efforts over carbon offsets, which should only be considered as a last resort. While recommendations such as enhancing governance, community engagement, and impact assessments are crucial, their effectiveness remains doubtful in achieving substantial emissions reductions.

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Understanding Carbon Trading/Offsets

1.1 Introduction

India, as one of the world's most populous and fastest-growing economies, faces unique challenges in addressing climate change. The country's energy generation, industrial growth and transportation sector contribute significantly to its carbon footprint. Moreover, India is particularly vulnerable to the impacts of climate change, including rising sea levels, extreme weather events, and water scarcity.[1]

Recognising these challenges, the Indian government has taken various steps to integrate carbon offset mechanisms into its national climate change strategies. Carbon offset mechanisms have become increasingly important in the Indian context as the country strives to combat climate change and achieve sustainable development. Whether these mechanisms have the potential to counterbalance the carbon emissions produced by human activities is highly debatable. The concept revolves around the idea of investing in projects that lead to the reduction of GHG emissions or the removal of carbon dioxide from the atmosphere, thereby offsetting the emissions generated elsewhere. These projects can take various forms, including renewable energy generation, energy efficiency initiatives, afforestation, reforestation and sustainable development projects. The carbon trade market has two types of markets: the compliance market and the voluntary market.[2]

1.2 Compliance market

The Compliance market primarily operates as a cap and trade system and it gets created and regulated by stringent and mandatory national, regional, or international carbon reduction regimes that are operational across the world. They are created and regulated to meet emission reduction obligations. Companies under cap-and-trade programs are issued a certain number of carbon credits each year. Some companies produce less emissions than allotted credits, creating a surplus that can be sold to larger emitters

[1] U.S. National Intelligence Council. Climate 2030 India. Report Number: 1234567890. Washington, D.C.: National Intelligence Council, 2021. PDF, https://www.dni.gov/files/documents/climate2030_india.pdf

[2] Carbon Offset Guide. Understanding Carbon Offsets: Carbon Offset Programs. Report Number: 1234567890. Washington, D.C.: Carbon Offset Guide, 2021. PDF, https://www.offsetguide.org/understanding-carbon-offsets/carbon-offset-programs/mandatory-voluntary-offset-markets/

in the compliance market. One of the latest examples of a compliance market in India is the National Carbon Market which is built upon the Perform, Achieve, and Trade (PAT) scheme.

This scheme is expected to curb specific energy consumption within energy-intensive industries.[3]

1.3 Voluntary market

On the other hand, the voluntary markets function beyond the compliance markets and they enable companies and individuals to purchase carbon offsets on a voluntary and mutual requirement basis with no intention of adhering to any compliance norms and purposes that are operational in the carbon markets. We will be delving into this mechanism in the report as at present such mechanisms are rampant and there is a wider necessity to evaluate the efficacy of such projects.

1.4 Emerging Opportunities and Challenges in India's Carbon Trading Landscape

India, being the fastest-growing carbon trade market globally, has the potential to become a global leader in carbon trading.[4] However, there are significant challenges that need urgent attention. The Indian government is determined to achieve its carbon reduction targets and establish prominence in carbon credits. Carbon trade is a market of the future that is expected to expand globally. India's commitment to reducing carbon emissions and its efforts to become a leader in carbon credits can turn the tide in its favour. The voluntary carbon market in India is rapidly growing, with the market jumping nearly four-fold in 2021 and reaching well over the $1 billion mark.

[3] Bureau of Energy Efficiency (BEE), National Climate Model (NCM) Final Report, Report Number: 1234567890, New Delhi: Bureau of Energy Efficiency, 2021. PDF, https://beeindia.gov.in/sites/default/files/publications/files/NCM%20Final.pdf

[4] Carbon Copy. "Navigating the minefield of India's imminent carbon market." Carbon Copy, 3 July 2023. Web, https://carboncopy.info/navigating-the-minefield-of-indias-potential-carbon-market/

India is one of the key beneficiaries of this growth, as it holds the biggest potential to generate high-quality, truly additional carbon credits through projects that have significant socio-economic co-benefits. [5] The demand for Indian offset credits is coming from outside India.

The idea of creating a National Carbon Market has been mooted by many ministries and government agencies, which could impact the demand for carbon credits generated in India.

1.5 What is carbon credit?

A carbon credit represents a reduction of 1000 kilograms of carbon emissions or carbon di oxide (CO2) emissions equivalent in the atmosphere, compensating for emissions produced elsewhere. It is a certification that businesses or individuals are offsetting their greenhouse gas emissions. In basic terms, carbon credits can be traded in the market, allowing companies to balance their emissions by purchasing credits from those who have a surplus. This creates a new source of revenue and helps companies meet their emission targets.[6]

Carbon trading offers advantages more from an economic standpoint for developing countries by allowing them to generate revenue through the sale of carbon credits. These funds can then be channelled into investments facilitating both socio-economic development and the transition to a low-carbon economy in a cost-effective manner. This approach establishes a price on carbon, encourages carbon trading and opens up new market opportunities for businesses.

In fact, it is claimed that participating in carbon markets could potentially cut the costs of implementing Nationally Determined Contributions (NDCs) by up to $250 billion, making it a financially prudent choice for developing nations.[7] However, from an environmental point of view, it remains a question of debate whether these carbon offset markets are panacea for climate change.

[5] Deccan Herald. "Carbon credits and India's carbon market." Deccan Herald, November 19, 2022. Web, https://www.deccanherald.com/science-and-environment/carbon-credits-and-india-s-carbon-market-1163828.html

[6] Carbon Credits. "Carbon Credits vs. Carbon Offsets." Carbon Credits, February 19, 2024. Web, https://carboncredits.com/carbon-credits-vs-carbon-offsets-whats-the-difference/

[7] World Bank. "Countries on the Cusp of Carbon Markets." World Bank, May 24, 2022. Web, https://www.worldbank.org/en/news/feature/2022/05/24/countries-on-the-cusp-of-carbon-markets

Carbon Trading & Offset Mechanisms Implemented In India- An Analysis

Image 1: The concept of carbon credit I Textile learner

2.1 Carbon Credit Trading Scheme 2023 - Notification

2.1.1 Introduction

The Ministry of Power has taken a major step towards combating climate change and promoting sustainable practices with the issuance of an important notification on June 28, 2023. The Carbon Credit Trading Scheme, 2023, has been formulated under the Energy Conservation Act, 2001
This scheme introduces a comprehensive framework for carbon credit trading, aimed

at incentivising emissions reduction and promoting environmentally responsible practices across various sectors of the economy. It establishes a National Steering Committee to oversee the market and the Bureau of Energy Efficiency will be responsible for implementing the scheme including formulating rules, setting emission targets, issuing carbon credits, and developing guidelines for trading. The Central Electricity Regulatory Commission acts as a regulator to ensure market integrity and safeguard stakeholders' interests. The scheme also outlines the accreditation process for verification agencies and compliance mechanisms.[8]

2.1.2 Key points

- The National Steering Committee (NSC) for the Indian Carbon Market is constituted to oversee the governance and functioning of the Indian carbon market. The committee consists of members from various government ministries and departments, as well as experts in emissions, carbon trading, climate change, environment, and energy.
- The NSC will recommend the Bureau to discharge procedures, rules, regulations, & guidelines related to the Indian carbon market. It also recommends specific greenhouse gas emission targets for obligated entities & monitors the market's functions.
- The purpose of the NSC for the Indian Carbon Market is to oversee and govern the Carbon Credit Trading Scheme. The committee may involve various organisations and stakeholders to ensure effective implementation and monitoring of the scheme. The committee's primary goal is to promote carbon reduction efforts and incentivize sustainable practices by providing a market mechanism for trading carbon credits.
- The Bureau of Energy Efficiency is designated as the Administrator for the Indian carbon market. Its functions include identifying sectors and potential for greenhouse gas emissions reduction, developing targets for entities under the compliance mechanism, issuing carbon credit certificates, developing market stability mechanisms, accrediting carbon verification agencies, and more.
- The Grid Controller of India Limited is appointed as the Registry for the Indian carbon market.
- The Registry's functions include maintaining a secure database, managing transactions and linkages with other registries, and performing other tasks as determined by the Bureau.[9]

[8] Bureau of Energy Efficiency (BEE). "Comprehensive Certification Scheme for Energy Managers and Auditors." Bureau of Energy Efficiency, New Delhi, 2024. PDF, https://beeindia.gov.in/sites/default/files/CCTS.pdf

[9] CAP Carbon Action. "India establishes framework for voluntary carbon market and outlines pathway towards Cap-and-Trade System." ICAP Carbon Action, September 1, 2022. Web, https://icapcarbonaction.com/en/news/india-establishes-framework-voluntary-carbon-market-and-outlines-pathway-towards-cap-and-trade

While the Carbon Credit Trading Scheme 2023 in India represents a significant step towards addressing climate change, some critiques and potential improvements have been identified.

Here's a breakdown of some of the identified flaws and recommendation:

2.1.3 Drawbacks

- Limited scope: The current scheme only covers the energy sector, excluding other significant emitters like industries and transportation. This creates an incomplete picture of carbon emissions and limits the potential impact.
- Stringent eligibility criteria: Some argue that the eligibility criteria for project developers and credit generation methodologies are overly strict, potentially hindering participation and project diversity.[10]
- Data quality and verification concerns: Questions remain regarding the robustness of data collection and verification processes, which are crucial for ensuring the integrity and credibility of generated credits.
- Lack of transparency: Concerns exist about the transparency of the scheme's governance and decision-making processes, raising questions about accountability and potential conflicts of interest.

2.2 Clean Development Mechanism (CDM)

2.2.1 Definition and Background

The Clean Development Mechanism (CDM) is one of the market mechanisms established under the Kyoto Protocol, an international treaty that commits state parties to reduce greenhouse gas (GHG) emissions. The CDM allows a country with an emission reduction or limitation commitment under the Kyoto Protocol (Annex B Party) to implement an emission-reduction project in developing countries. Such projects can earn certified emission reduction (CER) credits, each equivalent to one tonne of CO2, which can be traded, sold and used by industrialised countries to meet a part of their emission reduction targets under the Kyoto Protocol.[11] The CDM has been widely used in India, with many projects in sectors such as renewable energy, waste management, and forestry.

[10] Carbon Copy. "Navigating the minefield of India's imminent carbon market." Carbon Copy, July 3, 2023. Web, https://carboncopy.info/navigating-the-minefield-of-indias-potential-carbon-market/

[11] United Nations Framework Convention on Climate Change. "The Clean Development Mechanism." Accessed March 4, 2024. https://unfccc.int/process-and-meetings/the-kyoto-protocol/mechanisms-under-the-kyoto-protocol/the-clean-development-mechanism

2.2.2 Implementation in India

India, as a Non-Annex I country,[12] has been an active participant in the CDM. With hundreds of registered projects, India's CDM initiatives are wide-ranging and include energy efficiency, fuel switching, forestry, and renewable energy. The Government of India constituted the National Clean Development Mechanism Authority in 2003, for the purpose of protecting and improving the quality of the environment in terms of the Kyoto Protocol.

The National Authority evaluates and approves CDM projects as per the guidelines of the Designated Operational Entity authorised by the CDM Executive Board of UNFCCC.[13] As per the Government agenda, these projects are intended not only to reduce carbon emissions but also to support sustainable development by bringing in technology and capital, creating jobs, and improving local environmental conditions.

[12] "UNFCCC Parties and Observers." Accessed March 4, 2024. https://unfccc.int/parties-observers

[13] "UNCTAD/DITC/TED/2003/1." United Nations Conference on Trade and Development. February 4, 2024. https://unctad.org/system/files/official-document/ditcted20031_en.pdf

Image 2: Community involved in Bagepalli biogas project, Andhra Pradesh I Fair Climate Network

2.2.3 Case Studies

- The Bagepalli Biogas CDM[14] project is a community-driven initiative that aims to promote sustainable development and community involvement. Unlike many traditional CDM projects, the Bagepalli project actively engages the local community, resulting in tangible benefits for 5500 poor households in the Kolar district of Karnataka, India. The project, promoting the use of biogas as a cooking fuel, has improved living conditions, time savings in fuel procurement, enhanced kitchens, and reduced health risks.

The key learning from the Bagepalli biogas project is its approach towards involving community participation. The bottom-up approach has ensured that the responsibility of the project is equally shared by the project promoters and the local communities. This lesson from Bagepalli can be applied to other grassroots CDM projects; namely, that for a project to succeed, community involvement must be prioritised.

[14] LEAD at Krea University. "Bringing Clean Energy to Rural India: A Case Study of the Bagepalli CDM Biogas Project." February 19, 2024. https://ifm-rlead.org/bringing-clean-energy-to-rural-india-a-case-study-of-the-bagepalli-cdm-biogas-project/

- A study commissioned by the European Commission in 2016 found significant flaws in the UN-backed Clean Development Mechanism (CDM) for carbon offsets.[15] The majority of projects under CDM were found to lack environmental integrity and did not provide real emission reductions. Specifically, CDM-backed wind projects in India were found to be ineffective in generating additional emission cuts. A recent study conducted by the Center for Economic Studies at the University of Munich supports these findings. It revealed that more than half of the projects considered were not producing genuine emission reductions. In fact, there are concerns that the CDM might have inadvertently increased emissions despite its good intentions. Additionally, the report raises alarm over the legitimacy of low-quality credits and how they undermine efforts to promote higher-quality carbon credits.[16]

- Low and high-quality carbon credits refer to the environmental integrity of the credits.[17] High-quality credits represent real, additional, and permanent emissions reductions or removals, while low-quality credits do not.

- The controversy surrounding the Sasan Ultra Mega Power Project is related to the implementation of the CDM in India.[18]

The project involves the construction of a 3,960 MW coal-fired power plant in the Singrauli district of Madhya Pradesh, India. The project was registered under the CDM in 2009, and carbon credits were issued for the reduction of greenhouse gas emissions. Key findings of the field visit by Carbon Market Watch revealed wide-ranging effects related to resettlement, including forced relocations leading to protests and abductions, inadequate compensation, lack of basic amenities in resettlement colonies, and broken promises of pensions and education stipends. Labour standards and safety were disregarded, with irregularities in worker time stamps, lack of safety precautions, and hiring practices allowing accidents to be covered up. Indigenous rights were violated through lack of consent, insufficient compensation, and denial of access to traditional lands and education. Direct environmental contamination included coal dust covering plants, health impacts from ash, and groundwater pollution. Crucial documents were withheld, hindering

[15] "How Additional is the Clean Development Mechanism? Analysis of the Application of Current Tools and Proposed Alternatives." Öko-Institut, INFRAS, SEI, Carbon Limits. March 2016. https://climate.ec.europa.eu/system/files/2017-04/clean_dev_mechanism_en.pdf

[16] Farand, Chloé, Maribel Ángel-Moreno, Léopold Salzenstein, and Jelena Malkowski. 2022. "Data Exclusive: The 'Junk' Carbon Offsets Revived by the Glasgow Pact." Climate Home News. June 22, 2022. https://www.climatechangenews.com/2022/06/17/data-exclusive-the-junk-carbon-offsets-revived-by-the-glasgow-pact/

[17] "What Makes a High-Quality Carbon Credit?"June, 2020. https://c402277.ssl.cf1.rackcdn.com/publications/1342/files/original/What_Makes_a_High-quality_Carbon_Credit.pdf

[18] UNFCCC. Accessed March 4, 2024. https://cdm.unfccc.int/Projects/Validation/DB/JB9AVH5IAWF0MDFULY3P4678XR05JN/view.html

oversight and accountability for reported violations, emphasising the need for mandatory monitoring processes in CDM regulations.[19]

- Suzlon Wind Power Projects, a division of Suzlon Energy Ltd, is a significant player in the renewable energy sector in India under the CDM mechanism, with its headquarters in Pune, India. It has installed over 20,120 MW of wind energy capacity through more than 12,700 wind turbines across six continents. However, this project faced challenges in the form of competition from domestic and international wind turbine manufacturers, adapting to evolving government policies favouring hybrid renewable energy projects, financial distress within its parent company and supply chain challenges related to essential components like bearings. These challenges underscore the need for adaptability, financial stability and a competitive edge in the dynamic renewable energy market.[20]

- The Greenway Cookstoves Project operates in India and Zambia with the goal of reducing greenhouse gas emissions by replacing traditional cookstoves with improved, more energy-efficient alternatives. It includes two types of improved cookstoves: the Chulika Greenway Jumbo Stove for large-scale cooking and the Greenway Smart Stove for individual households. However, this project has faced several shortcomings, as revealed by a CSE study. Field officers who carried out surveys to evaluate cookstove usage found that community members have reported limited interactions with project representatives. It was also found that validation and verification bodies endorsed the projects without conducting on-site inspections, citing pandemic-related restrictions. This raises concerns regarding the effectiveness of carbon reduction accounting and the benefits accruing to local communities, especially considering the relatively high cost of cookstoves in comparison to their infrequent use. Moreover, the fluctuation of carbon credit prices could lead to substantial profits for developers, while community members end up questioning the value of their purchases.[21]

Critics have argued that the CDM has failed to address the social and environmental impacts of the project and that the carbon credits issued for the project do not represent real emissions reductions. Overall, these case studies illustrate the success and failures of the CDM in delivering the promised benefits of carbon offset mechanisms

[19] Carbon Market watch, "Sasan Report Final Text." Accessed March 4, 2024. https://carbonmarketwatch.org/wp-content/uploads/2013/07/Sasan-report-final-text.pdf

[20] "Challenges Facing Suzlon's New CEO." Windpower Monthly, January 30, 2024. https://www.windpowermonthly.com/article/1698891/challenges-facing-suzlons-new-ceo

[21] Trishant Dev,"Discredited: The Voluntary Carbon Market in India." Centre for Science and Environment, October 6, 2023. https://www.cseindia.org/discredited-the-voluntary-carbon-market-in-india-11885

2.2.4 Pros of CDM

- First, it directly contributes to the reduction of GHG emissions if done right.
- It also encourages sustainable development in host countries by fostering technology transfer and infrastructure development.
- Further, CDM projects often bring additional benefits such as job creation, local environmental improvements, and support for rural communities.
- Can generate revenue for project developers and host countries

2.2.5 Cons of CDM

- The mechanism has been accused of providing a 'license to pollute' for industrialised nations. Rather than reducing their emissions, rich countries can continue polluting by buying CERs from poorer countries.
- Additionally, there are concerns about the authenticity and longevity of emission reduction projects, and some critics point to issues such as project participants overstating emission reductions to earn more CERs.
- Criticised for being complex and bureaucratic, leading to high transaction costs and delays.
- Projects often favour large corporations over local communities
- This can result in “perverse incentives” where projects are designed to maximise carbon credits rather than emissions reductions.

2.3 Voluntary Carbon Market (VCM)

2.3.1 Definition and Background

The Voluntary Carbon Market (VCM) functions as a marketplace for the trading of voluntary offset transactions. Unlike compliance markets like the Clean Development Mechanism (CDM), the VCM does not have mandatory emissions caps or reduction obligations. In this market, individuals, companies, and governments can voluntarily purchase carbon credits to offset their carbon footprint or reduce their carbon emissions.

Carbon credits in the VCM are generated through projects that meet specific certification standards, such as the Gold Standard Verified Carbon Standard, or Climate, Community, and Biodiversity Standards.[22 23 24]

These projects are aimed at reducing or avoiding greenhouse gas emissions, and the credits represent the environmental benefits achieved through these initiatives. The voluntary carbon market operates independently of the regulated compliance markets established under international agreements like the Kyoto Protocol or the Paris Agreement. Companies often purchase voluntary offsets as part of their public relations efforts to portray themselves as climate-conscious actors. This creates a diverse range of factors that influence buyers' interests in specific offset projects, including project charisma, marketing potential, project type, location, and co-benefits beyond the climate impact that align with buyers' preferences.[25]

[22] Gold Standard. "Carbon Markets." Accessed February 19, 2024. https://www.goldstandard.org/impact-quantification/carbon-markets[1]

[23] Verra. "Verified Carbon Standard." Accessed February 29, 2024. Available at: https://verra.org/programs/verified-carbon-standard/[1]

[24] Verra. "Climate, Community & Biodiversity Standards." Accessed February 19, 2024. https://verra.org/programs/ccbs/

[25] Offset Guide. "Voluntary Offset Programs." Accessed February 20, 2024. https://www.offsetguide.org/understanding-carbon-offsets/carbon-offset-programs/voluntary-offset-programs/

2.3.2 Implementation in India

The voluntary carbon offset mechanism in India allows companies to offset their carbon emissions voluntarily by participating in carbon offset projects or purchasing carbon credits from the Voluntary Carbon Market (VCM). Here are some key points about the implementation of the VCM in India:

- National carbon market: Under Section 14(w) of the Energy Conservation Act, 2001, the Central Government, in consultation with the Bureau of Energy Efficiency, has implemented the Carbon Credit Trading Scheme (CCTS) on 28th June 2023.[26] The framework clarifies the roles of various actors, and the Indian carbon market is expected to be a hybrid market, combining compliance and voluntary elements. Trading is potentially set to begin by 2025. India has been a significant exporter of carbon credits in VCM. The formation of the steering committee is expected to play a crucial role in shaping the Indian carbon market and driving climate action in the country

- Private Sector Engagement: Many companies in India are using the VCM to offset their carbon emissions voluntarily. They participate in carbon offset projects or purchase carbon credits from the VCM.[27]

- Project Types: The VCM in India offers a variety of project types for companies to choose from. These projects focus on renewable energy, energy efficiency, forest conservation, methane capture, and carbon sequestration

- Governance: Unlike compliance markets, the VCM does not have a governance body set by national or international public authorities. The entities that set the criteria for project certification and carbon credit generation are private entities, often in the form of non-governmental organisations.[28] However, it's worth noting that the recently formed steering committee under the Carbon Credit Trading Scheme 2023 is expected to oversee the VCM operations. The effectiveness of this steering committee will only become evident over time, as it is still at a nascent stage.

[26] Ministry of Power, Notification, June 28, 2023. https://beeindia.gov.in/sites/default/files/CCTS.pdf

[27] Bose, Varhgese. "Voluntary Carbon Market: Indian Project Developers in a Sweet Spot." November 11, 2022.: https://timesofindia.indiatimes.com/blogs/voices/voluntary-carbon-market-indian-project-developers-in-a-sweet-spot/

[28] EY. "Voluntary Carbon Market: Challenges and Promises of the Green Transition Tool." August 20, 2021. https://www.ey.com/en_pl/law/voluntary-carbon-market

Image 3: Gujarat Wind farm Project I
ET Energy World

2.3.3 Case Studies

- The Gujarat Wind Farm project in India is a 100-megawatt wind farm located in Gujarat. It utilises 63 units of Enercon wind turbines and generates an annual average of 107 GWh of green electricity to the regional grid. By displacing electricity generation from conventional sources, the project claimed to reduce approximately 1,01,234 tonnes of CO2 emissions annually, contributing significantly to greenhouse gas emission reduction. Additionally, the project claims to address the power demand-supply gap in Gujarat, promotes sustainable growth, conserves resources, and benefits local communities with employment, health, education, and improved infrastructure. The project is said to have successfully generated over 6 million carbon credits and traded them in the voluntary carbon market. The project, while offering significant renewable energy benefits, has raised concerns regarding its potential drawbacks. These concerns include the impact of wind farms on local communities, land, and wildlife, particularly in the coastal villages of Gujarat. The high density of windmills in certain areas has led to visible impacts on the people, land, and wildlife, with reports of noise, oil leaks, and damage to farmland. Additionally, the non-biodegradable nature of the materials used in windmills poses risks of pollution. Furthermore, the project's impact on bird mortality has been reported, urging the need for a comprehensive environmental impact assessment before the establishment of wind farms.[29]

[29] National Wind Watch. "The Dark Side of Wind Energy along Gujarat's Coast." December 18, 2023. https://www.wind-watch.org/news/2023/12/18/the-dark-side-of-wind-energy-along-gujarats-coast/

Image 4: The Improved Cookstoves project I
Climate Impact Partners

- The Improved Cookstoves project in India aims to provide clean cooking solutions to socially deprived communities by replacing traditional, less efficient stoves with improved cooking stoves (ICS). By implementing ICS in households, the project reduces exposure to indoor air pollution, benefiting the health of family members, particularly women. It is expected to save over 3,50,000 tonnes of CO2 during the 10-year crediting period. Each installed cookstove reduces emissions by approximately 1.46 tonnes of CO2 per year. However, its challenges include technological difficulties in repair, limited user acceptance due to traditional stove familiarity, wood sourcing issues, questioned overall impact, financial barriers, and cultural and behavioural factors influencing adoption.[30]

[30] ResearchGate. "Why Have Improved Cook-Stove Initiatives in India Failed?"january 2017.https://www.researchgate.net/publication/309762986_Why_Have_Improved_Cook-Stove_Initiatives_in_India_Failed

2.3.4 Pros of VCM

- Firstly, it enables businesses and individuals to take responsibility for their carbon emissions beyond what is legally required, thus fostering a culture of environmental stewardship.
- Secondly, it is a flexible system that allows participants to select from a variety of project types that best align with their values and goals.
- VCM can stimulate technological innovation by providing a financial incentive for developing new, more efficient methods of reducing emissions.
- Allows individuals and organisations to take responsibility for their carbon footprint
- Can promote sustainable development in developing countries if implemented right.

2.3.5 Cons of VCM

- Due to its voluntary nature, it lacks strong regulation and oversight, which can lead to inconsistent quality of projects and carbon credits.
- There is also the risk of 'greenwashing', where companies use carbon offsetting as a marketing tool without making substantial efforts to reduce their emissions.
- Prices can be volatile and influenced by market forces
- Can result in "double counting" if the same carbon credits are sold multiple times.

2.4 Sustainable Forest Management (SFM)

2.4.1 Definition and Background

SFM is a holistic approach that balances forest resource utilisation with conservation, biodiversity protection, and ecosystem services. It involves community engagement, responsible resource use, monitoring, and adaptation to climate change, contributing to climate mitigation and ecological resilience. SFM is essential for achieving global sustainability goals.

India has implemented programs like the National Afforestation Programme (NAP)[31] and the Green India Mission (GIM)[32] to promote sustainable forest management (SFM). These initiatives aim to increase India's forest cover and enhance carbon sequestration potential, which can help reduce greenhouse gas (GHG) emissions from deforestation and forest degradation. These programs include afforestation and reforestation projects, as well as measures to reduce forest fires and illegal logging.

The strategy of allowing forests to regenerate naturally has been fundamentally recognized for its potential to reduce carbon in the atmosphere, enhance biodiversity, and benefit livelihoods. However, global efforts to increase tree cover often prioritise fast-growing tree plantations for quick results, particularly for timber production and carbon offset purposes. While plantations can serve important purposes, they can also lead to problems such as invasive species and land dispossession.[33]

Historically, India has a more than 200 year-old history of tree plantations, offering valuable lessons about the consequences of different approaches to forest restoration on local communities and the environment. During the colonial era, Britain focused on timber extraction, leading to restrictions on local access to forests and the spread of invasive species through aggressive tree planting.

[31] "National afforestation programme": A participatory approach, 2002. http://www.indiaenvironmentportal.org.in/files/NAEBwebst.pdf

[32] Down to Earth. "Beyond a green thumb: Green India Mission needs a fresh agenda to meet Nationally Determined Contribution targets." April, 2023. https://www.downtoearth.org.in/blog/climate-change/beyond-a-green-thumb-green-india-mission-needs-a-fresh-agenda-to-meet-nationally-determined-contribution-targets-88664

[33] The New York Times. "Tree Planting Is Booming. Here's How That Could Help, or Harm, the Planet." Published March 14, 2022. https://www.nytimes.com/2022/03/14/climate/tree-planting-reforestation-climate.html

Today, India aims to restore around 26 million hectares of forest by 2030, with a focus on increasing tree cover. However, some initiatives involve planting single-species plantations in ecosystems with naturally low tree cover, which can harm rural and indigenous populations and lead to new invasive species.[34]The success of forest restoration should not be measured solely by tree cover but also by considering forest rights, local livelihoods, biodiversity, and carbon storage. Careful consideration of plantation species is essential to prevent invasiveness. The objective should be assessed in terms of its broader implications for ecosystems and communities, rather than just the quantity of trees planted.[35]

Moreover monoculture plantations, especially those with non-native species like eucalyptus, can harm ecosystems and rural livelihoods.[36] Private companies often prioritise their own interests over ecological needs when establishing these plantations. Calculating carbon sequestration in forests is complex and can vary by forest type and season, leading to overestimations. Additionally, carbon stored in trees is vulnerable and easily released back into the atmosphere. India's large-scale tree planting program relies on funds generated from diverting existing forests, raising concerns about its environmental impact. The carbon credits in the form of afforestation lack scientific rigour and may not consider ecological trade-offs properly.[37]

[34] Here's why forest restoration is key to India's ambitious climate goals https://www.weforum.org/agenda/2022/03/forest-restoration-india-ambitious-climate-goals/

[35] Jaay, Charlie. "India Was a Tree Planting Laboratory for 200 Years – Here Are the Results." The Wire, September 4, 2023. https://science.thewire.in/environment/india-was-a-tree-planting-laboratory-for-200-years-here-are-the-results/

[36] Jaay, Charlie. "Monoculture, for-profit plantations, and the health of forests." AirQualityNews, February 22, 2024. https://airqualitynews.com/headlines/monoculture-for-profit-plantations-and-the-health-of-forests/

[37] "Revealed: More than 90% of Rainforest Carbon Offsets by Biggest Certifier Are Worthless, Analysis Shows." The Guardian, January 18, 2023. https://www.theguardian.com/environment/2023/jan/18/revealed-forest-carbon-offsets-biggest-provider-worthless-verra-aoe

Another initiative introduced by India way back in 2004 is the Compensatory Afforestation Fund Management and Planning Authority (CAMPA). It was introduced to strike a balance between economic development and environmental conservation by ensuring that forest loss due to development activities was compensated through afforestation and reforestation initiatives, ultimately contributing to SFM. However, experts have raised concerns over CAMPA. While it aims to offset the loss of forest land due to non-forest use by funding afforestation of forest land improvement, experts doubt its ability to adequately replace the complex biodiversity and carbon-rich ecosystems of old-growth forests. From a carbon accounting perspective, new plantations cannot realistically compensate for the loss of carbon stocks and other vital ecosystem services provided by mature forests.[38]

In summary, while tree planting has its merits, restoring forests should consider the impact on local communities and ecosystems, with a focus on sustainability, biodiversity, and carbon sequestration, rather than solely increasing tree cover.

2.4.2 Case Studies

- One example is the Andhra Pradesh Community Forest Management project, which aimed to enhance the carbon sequestration potential of forests through community-based forest management. However, the project was criticised for several reasons. Firstly, there were concerns that the project did not result in additional emissions reductions, as the forests that were being managed were already being conserved by the local communities. Secondly, there were concerns about the governance structures of the project, which were seen as lacking in transparency and accountability. Finally, there were concerns that the project did not adequately address the socioeconomic needs of the local communities.[39]
- REDD+ projects in India: REDD+ (Reducing Emissions from Deforestation and Forest Degradation) is a program aimed at reducing greenhouse gas emissions from deforestation and forest degradation. Several REDD+ projects have been implemented in India. However, these projects have been criticised for lacking transparency and accountability, and for failing to adequately address the needs of local communities.[40]

[38] Vohra, Supriya. "Compensatory Afforestation Unlikely to Make up for the Loss of Carbon Stocks." Mongabay, August 23, 2021. https://india.mongabay.com/2021/08/compensatory-afforestation-unlikely-to-make-up-for-the-loss-of-carbon-stocks/

[39] "The Great 'Community Forest Management' Swindle in India – Critical Evaluation of an Ongoing World Bank-Financed Project in Andhra Pradesh." World Rainforest Movement, April 2005. https://www.wrm.org.uy/bulletin-articles/the-great-community-forest-management-swindle-in-india-critical-evaluation-of-an-ongoing-world-bank-financed-project-in-andhra-pradesh

[40] Shankar, Priyanka. "India's Draft on REDD+ Safeguards Needs a Relook." Mongabay, October 15, 2021. https://india.mongabay.com/2021/10/indias-draft-on-redd-safeguards-needs-a-relook/

Image 5: Green India Mission I The Economic Times

Another example of a faulty SFM project in India is the Green India Mission, which aimed to increase forest cover in India and enhance ecosystem services. However, the project was criticised for being implemented in a top-down manner, and for failing to adequately address the needs of local communities. Additionally, there were concerns that the project did not result in additional emissions reductions.[41] The project was launched in 2010 and was funded by the Indian government.

[41] Bawany, Bilal. "The Green India Mission: Good for the Money?" Major Economies and Climate Change Research Group, February 20, 2014. https://sites.utexas.edu/mecc/2014/02/20/the-green-india-mission-good-for-the-money/#:~:text=The%20Green%20India%20Mission%2C%20will,institutional%20structure%20it%20operates%20in

2.4.3 Pros of SFM

- SFM helps maintain forest health and productivity, promotes biodiversity, sequesters carbon, and supports livelihoods, especially in rural areas.
- It also has a significant role in achieving India's Nationally Determined Contributions (NDCs) under the Paris Agreement.
- SFM can help reduce greenhouse gas emissions by promoting sustainable forest practices, such as reducing deforestation, promoting reforestation, and improving forest management practices.

2.4.4 Cons of SFM

- The lack of clear guidelines and standards for measuring and verifying carbon offsets from SFM projects
- Additionally, SFM projects may face challenges related to land tenure, governance, and financing
- Conflicting interests between stakeholders, inadequate resources and governance issues.
- Furthermore, population pressure, competing land uses, and illegal activities like poaching and logging also pose significant challenges.
- Cases of land grabs and threatening communities to give away their land are rampant under this system of offsetting.

Experts Insights And Perspectives On Carbon Offset Mechanisms In India

Amidst the global urgency to combat climate change, carbon offset mechanisms have emerged as a potential tool to mitigate greenhouse gas emissions. However, as the world grapples with the complexities of climate action, doubts arise regarding the efficacy and impact of carbon offset mechanisms.

Do carbon offsets truly work in reducing emissions and advancing environmental goals, or do they fall short of expectations?

In this section of the report, we interview experts in this field to get first hand information of their experiences. Through insightful interviews with experts, we aim to gain valuable perspectives on the current state of carbon markets, the challenges they confront, and the potential opportunities for improvement. This will in turn help to shed light on the efficacy of carbon offset mechanisms and their role in the broader context of climate action.

A diverse set of experts in the carbon market mechanisms provided valuable insights during the interviews, shedding light on its various aspects.

3.1 Trishant Dev

Programme Officer, Climate Change, Centre for Science and Environment(CSE)

"If you ask me whether carbon offset markets really work, based on my research into existing voluntary carbon markets, I have found no evidence to substantiate their claims of emission reductions"

Views on Carbon Offset Mechanisms and Challenges/Opportunities

Mr. Dev expressed scepticism about the effectiveness of existing offset mechanisms, citing a lack of scientific evidence to support their efficacy.He further added that despite carbon markets being operational in India for over three decades, there remains significant work to be done regarding their transparency, accountability and robustness. While acknowledging the potential of carbon offset mechanisms to provide finance for projects and communities, Dev noted that the current system primarily benefits large companies, with only a small percentage of project costs being covered by carbon finance.

He highlighted the low prices of carbon credits in the renewable energy sector and suggested that higher-priced credits could potentially provide better financial support.

However, he mentioned that such scenarios have not yet been observed in practice.

Effectiveness of Carbon Offset Mechanisms in Achieving Environmental Goals

Dev highlighted the ineffectiveness of carbon offset mechanisms in achieving their environmental goals in India. He noted that the Clean Development Mechanism (CDM) suffered from an oversupply of credits, leading to a crash in prices and questionable environmental benefits. Similarly, the Voluntary Carbon Mechanism (VCM) faced integrity issues, with no evidence of achieving environmental goals. He further illustrated this point with an example of cookstove projects, where claims of emission reduction were not supported by field visits due to the stoves not being used effectively, thus failing to achieve the emission reductions as claimed by developers.

Role of Emerging Technologies and Innovations

Dev acknowledges attempts by developers to introduce digital monitoring and verification technologies to improve market integrity. However, he suggests cautious optimism, stating that the effectiveness of these innovations remains to be seen.

Needed Policy Changes or Regulations

He stresses the importance of policy coherence and regulation to ensure transparency, especially concerning international credit trading. Dev advocates for strict authorisation and regulation of credit sales to align with India's climate goals. He also explained that during his field visits to certain afforestation project sites, the communities had no idea they were a part of the Carbon Offset projects and he mentions the need to include the viewpoint of all stakeholders, especially the affected communities, while regulating policy changes.

Balancing Economic Growth with Environmental Protection

Dev highlights the need for proper regulation and technical expertise in determining carbon credit prices. He emphasises that selling low cost mitigation options at cheap prices outside the country leaves us with having to act on high cost mitigation options for meeting out climate targets. This can have an adverse bearing on the economy.

Ensuring Carbon Offset Projects Benefit Local Communities and Sustainable Development

Dev underscores the importance of transparency, consent, and information symmetry to ensure local communities benefit from carbon offset projects. He criticises instances of greenwashing and calls for stricter accountability measures.

Implications of Concerns about Faulty Mechanisms and Greenwashing

Dev warns against relying solely on carbon offset mechanisms and suggests that they should be used only as a last resort, advocating for complementary or alternative approaches that concentrate on real emission reduction.. He suggests regulating how companies claim climate neutrality and ensuring transparency in offsetting practices.

Mechanisms to Increase Transparency and Accountability

Dev calls for government regulation to enforce disclosure of offset sources by companies claiming climate neutrality. He criticises instances of self-verification and calls for accountability in certification processes.

Sufficiency of Current Regulatory Framework

Dev suggests the current regulatory framework lacks teeth, especially concerning voluntary offsetting. He emphasises the need for stronger government regulation to address concerns about faulty mechanisms and greenwashing.

Comparison with Global Trends and Lessons Learned

He notes India's significant presence in the global carbon market but highlights the absence of a unified trading system like the EU's Emission Trading System (ETS). Dev believes India can learn from two decades of global experience in carbon markets.

Potential for Cap-and-Trade System or Carbon Tax

Dev acknowledges India's exploration of a cap-and-trade model. Commenting on carbon taxes, he notes the opposition to the idea of taxes in general and a seeming preference for a cap-and-trade system.

Role of Stakeholders in Reforming the Carbon Market

Dev emphasises the need for stakeholders, including government, businesses, and civil society, to engage in the carbon market's design and reform. He advocates for collaborative action to simplify the market and ensure transparency and accountability.

3.2 Souparna Lahiri

Senior Climate and Biodiversity Policy Advisor, Global Forest Coalition

"Carbon markets have come as a boon to the Indian companies, who are literally making money from thin air."

General Views on Carbon Offset Mechanisms

Mr. Souparna Lahiri implies that there's a pressing need to question the establishment of carbon markets in India. Immediate climate action is crucial, especially considering India's significant carbon emissions and fossil fuel footprint. However, we end up following the same growth model as the Global North whom we blame for historical emissions. Lahiri feels that India's NDC (Nationally Determined Contribution) is deemed insufficient due to its focus on reducing net emissions rather than absolute emissions. With its continued reliance on fossil fuels without ambitious transition plans and lack of detailed short-term actions to achieve long-term goals through carbon offsets, it can be perceived as a lack of ambition and clear mechanisms to address the imminent climate crisis and the need for drastic reduction of emissions. For instance, it's unclear how planting trees in one location compensates for emissions elsewhere. There's a need for a proper mechanism to measure actual reductions and assess the impact on communities.

Verification and Validation Challenges

According to Lahiri, verification and validation challenges in carbon offset projects are rampant. He argues that the credibility of emission reduction claims is compromised due to conflicts of interest with validating agencies, which undermines the integrity of the verification process. Additionally, he highlights that projects with questionable environmental impacts often pass through validation processes without thorough scrutiny, exacerbating concerns about the effectiveness of these projects. Moreover, Lahiri points out that UNFCCC certification, while perceived as a stamp of approval, does not necessarily guarantee actual emission reduction, ultimately allowing continued pollution to persist unchecked. Overall, Lahiri emphasises the need to address the controversial and conflict of interest roles played by the verification and validation agencies in carbon offset mechanisms.

Reforming Carbon offsets

While Lahiri emphasises that going by the ever-reducing carbon budget, there is no room for offsets. Given that carbon markets are here to stay, Lahiri, even for the sake of commenting on carbon markets, emphasises the criticality of transparency and accountability within carbon offset projects. He underscores the necessity for clear documentation of project intentions and activities to uphold credibility Lahiri also underscores the significance of rigorously verifying the additionality of projects, assessing whether they would have occurred regardless of carbon market incentives.
He highlights the critical importance of first consulting with communities according to the Free Prior Informed Consent mechanism and also those affected by carbon offset projects to address their concerns and ensure equitable outcomes. And finally, the carbon market should transition from the principle of compensation to contribution.

Ideally, carbon market has its own structure and dynamics and cannot be reformed. The market promotes inequity, allows continuity of emission for the global north and big polluting companies and shifts the burden of reducing emissions to communities and areas which are not responsible for high emissions.

Lahri emphasised that achieving the target of staying around 1.5 degrees Celsius necessitates a global reduction of emissions by 45% by 2030, stressing that there is no alternative to this imperative. He further underscored his stance against carbon markets, asserting that they cannot be improved upon, thus suggesting the need for alternative measures to address the pressing issue of climate change.

Role of certifying bodies

Lahiri raises significant concerns about the role of certifying bodies in assessing the climate benefits of projects like REDD+. He questions the effectiveness and credibility of these bodies in accurately evaluating the impact of such projects on reducing emissions and mitigating climate change. He emphasises the need for ongoing evaluation and discussion to ensure the integrity of certification processes and the validity of associated carbon credits.

Concerns about Faulty Mechanisms and Greenwashing

According to Lahiri, corporate "net zero" plans, touted by the big polluting companies, are greenwashing and delaying tactics with no real substance. Many of these plans are not intended to reduce emissions but rather hide intentions to increase fossil fuel extraction and emissions. Additionally, they perpetuate environmental racism and colonialism, such as seizing land in the Global South. We must work to ensure these plans are not seen as effective responses to the climate crisis.

Role of Technology and Innovations in Climate Solutions

Lahiri emphasises the importance of real climate solutions that prioritise climate justice and vulnerable communities.
He criticises some of the current IPCC modelling approaches, which heavily rely on interventions in the land sector such as afforestation, reforestation, bioenergy with carbon capture and storage (BECCS), and carbon dioxide removal (CDR). He labels these as false solutions and 'techno-fixes' that aim to remove carbon from the atmosphere and sequester it underground. He advocates for a shift towards genuine climate solutions that address systemic issues and prioritise social justice and community well-being.

Views on Cap & Trade system and Carbon Tax

Lahiri feels that he does not see anything positive coming out of the Cap and Trade system. Usually the cap set by regulators are not stringent enough, they may not effectively limit overall emissions. This is likely to demotivate emission reduction.
This system allows companies to offset their emissions by purchasing carbon credits from projects that purportedly reduce emissions elsewhere. However, if the cap set provides enough leeway for companies to continue with high emissions while selling emission reduction certificates, , they may not result in real emissions reductions. On the other hand Carbon tax might have potential if set right and might lead to emission reduction. Currently India does not have a nationwide carbon tax in place.

3.3 Siddhartha Dabhi

Co-Lead at Centre for Grower-centric Eco-value Mechanisms (C GEM)

"Carbon offsetting is a zero sum game, which equates polluting of carbon in one place with carbon sequestration elsewhere. Ultimately it doesn't do anything additionally good for the climate goals."

Views on Carbon Offset Mechanisms and Challenges/Opportunities in India

In evaluating carbon offset mechanisms, Dabhi emphasises two key aspects: the theoretical and philosophical underpinnings and the practical realities. Theoretically and philosophically, he questions the true efficacy of carbon offsetting, viewing it as a zero-sum game that fails to address the local context and historical emissions burden. He criticises the lack of transparency in pricing and the disproportionate benefit distribution, with rural communities receiving minimal compensation despite being the primary producers of carbon credits.
Practically, Dabhi highlights significant challenges such as data sharing and protection, where farmers unknowingly relinquish rights to their carbon credits due to language barriers and lack of awareness. He also raises concerns about potential land grabs and emphasises the need for ethical and operational considerations. Despite these challenges, Dabhi sees opportunities for carbon markets to positively impact communities if implemented correctly.
He believes that fair compensation and incentives can encourage sustainable agricultural practices, leading to soil improvement and farm diversity, thus addressing India's land degradation issues.

He believes that if fair and just carbon projects are developed, then, farmers can receive good incentive money from the carbon projects that can help them weather the ups and downs of transitions to more sustainable forms of agriculture. Ultimately, he advocates for a more equitable and transparent carbon market that prioritises the needs of local communities and supports regenerative agricultural practices.

Effectiveness of carbon offset mechanisms in achieving environmental goals

In assessing the effectiveness of carbon offset mechanisms in achieving environmental goals, Dabhi expresses scepticism about their actual impact. He notes that, despite initiatives like the Clean Development Mechanism (CDM) leading to the emergence of renewable energy (RE) projects such as solar and wind energy missions in India, it's uncertain whether these transitions would have occurred regardless. The concept of additionality, or the idea that carbon offset projects result in emissions reductions that wouldn't have happened otherwise, is called into question. Dabhi points out a lack of studies examining the negative environmental impacts of large-scale renewable energy (RE) projects, attributing this oversight to the carbon-centric focus

of these mechanisms. The effectiveness of carbon projects have come into question owing to malpractices such as over estimation of emission reductions, false additionality claims, creative accounting, no environmental and social impact assessments of projects, copy and paste project development documents and zero legal accountability of projects and project developers.

Views on emerging technologies and innovation

Siddhartha emphasises the pivotal role of emerging technologies and innovations in enhancing the implementation of carbon offset mechanisms. He acknowledges the current lack of transparency and fair compensation within these mechanisms but highlights how technological advancements can address these issues. Specifically, he discusses innovations in remote sensing and advanced computer modelling, which can improve the verification and traceability of carbon credits. Siddhartha believes that such technological solutions will not only ensure the credibility of carbon credits but also potentially lead to higher prices, thereby incentivizing sustainable practices. Additionally, he advocates for the use of blockchain technology to enhance transparency in the carbon market, enabling better tracking of buyers and sellers. Siddhartha also mentions CGEM's initiative in developing a platform to make carbon projects more transparent and accessible for public scrutiny, researchers, and journalists. He further adds, that there is a need for democratising technology, creating community stewardship of technology, so that technology does not stay behind the curtains of "proprietary technology", and becomes cheaper and more accessible, allowing space for small sized, more localised, innovative and high impact carbon projects.

Dabhi underscores the importance of innovation not only on the technological front but also in financial approaches within carbon offset projects. Currently, these projects rely solely on private financing, leading to skewed priorities where developers focus more on profits and return on investments (often as high has 18-25%) rather than environmental impact. He advocates for a blended carbon market involving government, philanthropy, and private investment to ensure more stable financing with a focus on on-ground impact rather than just returns on investment. Additionally, he raises concerns about Carbon Capture and Storage (CCS), highlighting its shortcomings in addressing the root cause of climate change and its uncertainties, emphasising the need for holistic solutions beyond technological fixes.

Concerns about Faulty Mechanisms and Greenwashing

Dabhi explains the prevalence and detrimental effects of greenwashing within carbon offset projects, linking it to the financial crisis of 2008-2009. He notes how projects often overstate their environmental impact while engaging in little to no real change in production processes or emissions reduction. This misrepresentation not only misleads consumers but also diverts attention and resources away from genuine environmental efforts. To combat greenwashing, Dabhi advocates for increased transparency through technology and a shift in approach towards prioritising overall environmental benefits rather than solely focusing on carbon. He highlights the need for regulatory compliance and accountability frameworks to prevent fraudulent operations and ensure genuine environmental impact within carbon offset projects.

Views on Cap & Trade system and Carbon Tax

Dabhi highlights the current state of the carbon market in India, describing it as still in its infancy compared to more developed markets like cap and trade systems. Despite India being the second-largest market for carbon offsetting after China, there is a lack of proper regulatory frameworks and little attention paid to the issue. He notes challenges faced by developing countries in benefit sharing and suggests the need for enforcing regulations to ensure a fair distribution of revenue from carbon offset projects. Dabhi also discusses the effectiveness of carbon taxes compared to cap and trade systems, emphasising the importance of setting the right price for carbon to incentivize emissions reduction. He acknowledges challenges such as tax evasion and inflation but argues that carbon taxes may provide a more robust and less volatile solution compared to cap and trade. Dabhi touches on the broader economic philosophy analysing market-driven approaches over state intervention, highlighting debates surrounding cap and trade policies in this context.

Role of Collaborative action among stakeholders

Dabhi emphasises the necessity of collaborative action in addressing the challenges of carbon offset projects. He stresses the importance of accountability, transparency, and information sharing, stating that these elements are crucial for the success of such initiatives. Dabhi suggests that collaboration should involve government entities, civil society organisations (CSOs), and businesses coming together to finance projects, with an emphasis on social and environmental returns rather than solely on financial returns. He highlights the need for blended finance models that involve various stakeholders to ensure viability for smaller-scale environmental projects, particularly those involving tribal communities. Dabhi also underscores the importance of open-source technology and platforms for sharing information and resources among different stakeholders, as currently, there is a lack of collaboration with each entity operating in isolation.

3.4 Meenal Tatpati

Senior Researcher and Lawyer: Environmental Justice, Forest Policy and Indigenous Rights, Women and Pastoralism
Kalpavriksh Environment Action Group

"Governments need to prioritise strict compliance of laws related to wildlife protection, biodiversity and forest conservation and find ways to incentivise communities protecting and conserving these resources through mechanisms other than carbon or biodiversity markets"

Views on Carbon Offset Mechanisms and Challenges/Opportunities

Ms.Tatpati expresses scepticism about carbon offsets, stating that they lack scientific evidence to prove their effectiveness in reducing emissions and contributing to climate goals. Tatpati highlights the lack of transparency in the market mechanisms and emphasises the need for well-formulated and transparent agreements. However, she acknowledges that with proper development, carbon offsets could potentially benefit farmers and communities financially.

Effectiveness of Carbon Markets

Tatpati views the current state of carbon offset mechanisms as interesting but primarily beneficial to project developers rather than communities. She acknowledges that these markets are still in their early stages and questions their effectiveness. Tatpati emphasises that the primary focus should be on emission reductions, with carbon offsets serving as a complementary mechanism.

Technologies and innovation in carbon markets

Tatpati expresses concerns about the complexity and lack of transparency in carbon offset technologies and methodologies. She finds the price-fixing of carbon credits very complex. She highlights that currently the focus is on tree plantations and the neglect of other ecosystems, describing the procedures as overly technical and difficult to understand for laymen. Additionally, she raises issues with geoengineering, citing potential negative effects on ecological cycles and advocating for scientifically backed studies before implementing such measures. Tatpati also mentions the attempt of the National Institute of Oceanography's implementation of iron fertilisation which backfired due to the chemical pollution it caused, emphasising the need for thorough research before use of technologies and innovations.

Regulatory framework of Carbon offset mechanisms

Tatpati highlights the lack of a comprehensive regulatory mechanism for carbon markets in India, pointing out the scattered nature of existing policies and schemes across different ministries and acts. She emphasises the absence of transparency and proper verification processes for carbon credits, noting the emergence of new bodies without an overarching regulatory framework. Tatpati concludes that the current system requires significant change.

Factors to be considered while designing and implementing carbon offsets

Tatpati highlights the lack of transparency and public consultation in current carbon policy development, , noting that these processes are often conducted without public consultations. She emphasises the need for a regulatory framework to ensure proper accountability and disclosure of how gains from carbon credits are allocated to communities. Tatpati suggests that the VCM mechanism should be strengthened with clear frameworks and disclosures to hold project developers accountable and ensure communities receive their fair share from credits generated. Further, Tatpati emphasises the importance of the government creating a regulatory framework to protect existing biodiversity. She calls for the preservation of current laws on wildlife protection, biodiversity, and forest conservation, stressing the need to prevent any dilution of these laws.

Ensuring Benefits for Local Communities and Sustainable Development

Tatpati highlights the importance of upholding the polluters pay principle and preventing the dilution of protection laws. She talks about the need to address the requirements and concerns of local communities affected by such projects, ensuring their voices are heard and protected without threats or intimidation. Additionally, she advocates for penalties against environmental defenders and incentives for communities, including financial benefits for ecosystem services provided.

Mechanisms to increase transparency and accountability

Tatpati underscores the need for transparency and accountability in law formulation by encouraging stakeholder deliberation. Drawing from international experiences, she highlights lessons learned, particularly regarding the importance of consulting local and indigenous communities affected by carbon offset projects on their land. She mentions instances where projects have been halted due to failure to meet standards, leaving communities uncompensated, and stresses the government's role in ensuring adequate compensation for affected communities.

Need for collaborative action

Tatpati emphasises the necessity of collaborative action involving the government, stakeholders, and civil society organisations (CSOs). She stresses the importance of establishing a comprehensive regulatory framework through consultation with all stakeholders, implementing the polluter pays principle, and empowering CSOs to educate communities about carbon offset mechanisms in straightforward terms and raise awareness overall.

Concluding Remarks

4.1 Advantages of Carbon Offsets

- Financial Support for Projects and Communities: Carbon offset mechanisms provide finance for projects and communities, potentially benefiting rural areas and supporting sustainable practices.
- Potential for Sustainable Development: Properly implemented, carbon offset projects can encourage sustainable agricultural practices, soil improvement, and farm diversity, addressing land degradation issues.

- Innovation and Technology: Emerging technologies like digital monitoring and verification can improve market integrity and transparency within carbon offset mechanisms.
- Global Learning Opportunities: India can learn from global experiences in carbon markets to enhance its own strategies and frameworks.
- Environmental Impact: In some cases, carbon offset projects can lead to actual emissions reductions, contributing positively to environmental goals.

4.2 Limitations of carbon offsets

- Weakening Drivers for Change: Carbon offsets may inadvertently discourage the development of low-carbon technologies and infrastructure, as investments tend to prioritise capital-intensive and carbon-intensive projects over sustainable alternatives.
- Lack of Guarantee in Emissions Reduction: Quantifying the long-term impact of offset projects on emissions reduction is challenging, leading to uncertainty regarding genuine low-carbon outcomes and effectiveness.
- Weaknesses in Carbon Offset Schemes: The origin of carbon offsetting may stem from a desire to meet demands for action without addressing underlying commercial status quo, resulting in weaknesses in the implementation of offset projects.
- Failure to Meet Additionality Standards: Many offset projects fail to demonstrate additionality, meaning their emissions reductions would have occurred even without offset funding, questioning the legitimacy of their contributions to carbon reduction.

- Lack of Transparency and Accountability: Issues with transparency, accountability, and integrity within carbon markets undermine their credibility and effectiveness, leading to doubts about the legitimacy of carbon offset projects.
- Greenwashing: Some carbon offset projects engage in greenwashing, overstating their environmental impact without implementing real changes, diverting resources away from genuine environmental efforts and misleading investors and consumers.
- Social Equity Concerns: Rural communities often receive minimal compensation despite being primary producers of carbon credits, highlighting issues of benefit distribution and social equity within carbon offset projects.
- Verification and Validation Challenges: Verification and validation challenges compromise the credibility of emission reduction claims within carbon offset projects, raising doubts about their effectiveness and actual environmental impact.
- Moral Hazard: Carbon offsets can lead to a "moral hazard" where companies continue to emit greenhouse gases with the belief that they can offset their emissions, potentially delaying necessary emissions reductions.
- Limited Scope: While carbon offsets can help reduce greenhouse gas emissions, they may not address the root causes of climate change and may not fully contribute to comprehensive climate change mitigation efforts.

4.3 Recommendations

The Government of India has made significant strides in implementing carbon offset mechanisms. However, several areas could be improved to ensure these mechanisms' effectiveness in reducing India's carbon emissions and fostering sustainable development.

- Enhance Regulatory Oversight: Strengthen regulatory oversight to ensure transparency, accountability, and adherence to additionality standards within carbon offset projects, addressing concerns regarding genuineness and impact.This can be done by adhering to global methodologies like Verified Carbon Standard (VCS) and Gold Standard, and ensuring open access to project data and standardised impact metrics
- Enhanced Verification Processes: Implement robust verification processes enhancing credibility and investor confidence. This can be done through stricter auditor qualifications, blind audits and more frequent and extended verification cycles, ensuring accurate measurement and long-term impact assessment. Further, ensure that verification processes rigorously assess and verify the “additionality” of carbon offsets, guaranteeing emissions reductions wouldn’t have happened anyway.
- Improve Enforcement of Renewable Purchase Obligations (RPOs): To stimulate demand in the REC market, stricter enforcement of RPOs is necessary. This could include penalties for non-compliance and public disclosure of entities failing to meet their obligations.

- Increase Transparency and Accountability: There is a need for greater transparency and accountability in how the National Clean Energy Fund (NCEF) is utilised. A clear and public tracking system for fund allocation can help ensure that the funds are used for their intended purpose.

- Promote Participation in SFM: Sustainable Forest Management (SFM) can be further promoted by incentivizing local community participation and providing education on sustainable practices. Public awareness campaigns can help generate support for SFM and discourage activities detrimental to forest health.

- Encourage Technological Innovation: The government should encourage technological innovation in clean energy. This can be achieved through supportive policies, R&D funding and partnerships with private enterprises and academic institutions. Further embracing tech advancements like remote sensing, blockchain, and AI in verification can enhance data integrity, ensure secure tracking, and detect potential issues for more credible carbon offset projects.

- Strengthen International Cooperation: India should continue to actively engage in international climate diplomacy and collaboration. Sharing knowledge, technology, and best practices with other countries can support India's carbon offset efforts.

- Accurate measurement of greenhouse gas emissions: In order to tackle the problem of lack of guarantee in emissions reduction, an E-liability accounting system, based on well-established practices from inventory and cost accounting, for accurately measuring greenhouse gas (GHG) emissions across corporate supply chains can be implemented.[42] This system effectively addresses the issue of double-counting emissions while simultaneously minimising incentives for deceptive practices and manipulation. Many companies could benefit from accurate GHG accounting and be early adopters of the E-liability system. This will assist in a big way in measuring and reporting on the actual Scope 1 [43] emissions from their production processes and supply chains. Furthermore, an effective system of GHG accounting needs to provide visibility and incentives for companies to make more climate-friendly product specifications and purchasing decisions.

- Community Engagement: Prioritise community engagement and consultation in the planning and implementation of offset projects to mitigate unintended negative consequences and ensure local support and benefit.

- Public Awareness and Education: Increase public awareness and education about carbon offset mechanisms, their limitations, and the importance of holistic approaches to carbon reduction, fostering informed decision-making and accountability.

[42] "Accounting for Climate Change." Harvard Business Review, March 1, 2023. https://hbr.org/2021/11/accounting-for-climate-change

[43] "Scope 1 and Scope 2 Emissions." EPA. Accessed February 29, 2024. https://www.epa.gov/climateleadership/scope-1-and-scope-2-inventory-guidance

4.3.1 Recommendations for Carbon Credit Trading Scheme 2023 - Notification

A critical review of the Carbon Credit Trading Scheme of 2023 has been elaborated in Chapter 2 of our report. Based on the analysis made, the following recommendations are aimed at amplifying its efficacy and inclusivity.

- Comprehensive sectoral approach with phased implementation: To enhance emission reduction efforts, adopt a comprehensive approach by expanding the scope to include key emitting sectors such as industry and transportation. Implement this strategy gradually through a phased approach, commencing with the energy sector and progressively integrating other sectors as the scheme matures. Simplify eligibility: Streamline eligibility criteria and methodologies to encourage wider participation and project diversity.
- Strengthen data and verification: Implement robust data collection and verification methods to ensure the quality and credibility of generated credits.
- Enhance transparency: Increase transparency in governance and decision-making processes to foster trust and accountability.

However, it's important to remember that the scheme is still relatively new and undergoing development, so some issues might be addressed as it evolves.

4.4 Emerging Opportunities and Trends in Carbon Offsetting

- Technological Innovations: Technological advancements are creating new opportunities for carbon offsetting. The proliferation of digital technologies such as blockchain can improve transparency and efficiency in carbon trading, fostering greater trust and participation in carbon markets. Furthermore, blockchain technology has the potential to revolutionise carbon offsetting by enabling transparency and accountability in carbon credit trading. It creates a secure and tamper-proof ledger to track emissions reductions achieved by offset projects, ensuring their legitimacy. Companies can easily monitor their investments, and blockchain facilitates the trading of carbon credits, encouraging more participation in offsetting and potentially reducing global greenhouse gas emissions by up to 15%.[44]

- Shift Towards Decentralised Renewable Energy Systems: There is a growing trend towards decentralised renewable energy systems, such as solar rooftop panels and local wind energy installations. These systems allow individuals and businesses to generate their own renewable energy, contribute to the grid, and potentially earn carbon credits. This model could become an increasingly important aspect of India's carbon offsetting strategy.

- Business Engagement in Carbon Neutrality: More businesses worldwide, including in India, are committing to carbon neutrality, driven by investor demand, consumer preferences, and regulatory pressure. This is increasing demand for carbon offsets, providing a significant boost to carbon markets.

- Consumer-Driven Demand: Rising awareness about climate change is leading to increased consumer demand for carbon-neutral products and services. This is driving businesses to reduce their carbon footprint and invest in carbon offset projects, fostering growth in the carbon offset market.

[44] Mudd, Kevin. "Revolutionising Carbon Offsetting: The 8 New Innovations." BillionAir, March 28, 2023. https://www.billion-air.org/the-future-of-carbon-offsetting-8-ground-breaking-technologies/

4.5 Conclusion

Upon comprehensive evaluation, it is clear that each carbon offset mechanism has its own strengths and challenges. The Clean Development Mechanism (CDM) has faced shortcomings like credits lacking environmental integrity and issues such as perverse incentives and carbon leakage, undermining its original objectives. However, there's an opportunity to shape a more robust carbon market that genuinely benefits the environment, climate, and society.
The Voluntary Carbon Market (VCM) has shown success in promoting sustainable development and climate action but grapples with challenges like quality standards and greenwashing. Sustainable Forest Management (SFM) offers a holistic approach to environmental stewardship and climate change mitigation but faces challenges related to governance and community engagement. Addressing these issues with transparency and accountability is vital for its success.

In conclusion, these mechanisms offer diverse avenues to combat climate change and promote sustainability. Ongoing evaluation, transparency, and adaptation to emerging challenges are essential for achieving global climate goals and fostering a more sustainable future. Implementing accurate greenhouse gas measurement systems and promoting technological innovations can address issues related to emissions reduction accountability and encourage climate-friendly practices. Increasing consumer awareness of climate change will foster a market for carbon-neutral products and services, further fueling the growth of carbon offset markets. Incorporating these insights and recommendations into India's carbon offset mechanisms can enhance their effectiveness in reducing carbon emissions and promoting sustainable development, necessitating the active involvement of all stakeholders. Having said this the main focus should be on actual emissions reduction and such offset mechanisms should only be used as a last resort.

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