THE EMERGING CARBON MARKET IN INDIA

Possibilities and Potential Pitfalls of Carbon Finance for Emissions Reduction

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EXECUTIVE SUMMARY

Climate change can be seen as a market failure for a number of reasons, and reducing greenhouse gas emissions is a critical part not only of slowing and mitigating climate change but of correcting its market failures. The use of carbon financing - a funding tool to further climate change objectives by trading in carbon credits to make it a marketable good - and establishment of carbon markets has the potential for significant financial and environmental impact in industries ranging from agriculture to electric vehicles. To ensure these markets operate in an effective and ethical manner, however, the state must intervene and ensure the usage of standardised methodologies and regulations. The private sector, apart from its current involvement in development of renewable energy, must also expand in the space of financial adaptations. In India, the recent passage of the Energy Conservation Amendment Bill, which includes provisions on establishing carbon markets, marks an important step forward in formalising and regulating carbon offset trading and ultimately in reducing and mitigating greenhouse gas emissions in order to meet Nationally Determined Contributions.

INTRODUCTIONS

Free markets are considered to *fail* if they do not maximize societal welfare, among a number of other potential reasons. This type of market failure relates to climate change as most of the costs associated with and effects of greenhouse gas emissions do not go to individuals or countries responsible for producing them; rather, they are borne by people in developing nations or by future generations. Additionally, because the harmful consequences of greenhouse gasses are *external* to the market, firms and consumers are typically motivated to limit their emissions more out of an ethical than an economic concern. This results in the production of excess levels of greenhouse gases, further indicating market failure.



Along with the greenhouse gas externality, there are several other climate change-related market failures, such as those brought on by network effects, an absence of innovative financial rewards, and an insufficient understanding about how to minimise emissions. Recognising these failures, many economic experts concerned about climate change argue for the implementation of a number of corrective measures, including placing a price on carbon and establishing a carbon market.

Carbon markets are, in short, systems through which emission reductions certificates (ERCs) or carbon credits are bought and sold by individuals, private companies, and government entities. These may be either compliance markets, created in response to national or international policies or regulations, or voluntary markets, which emphasize the ethical concerns mentioned previously.

In both compliance-based and voluntary markets, carbon finance entails the production, allowance, and trading of carbon credits, sometimes also referred to as carbon offsets. Carbon credits, which reflect the removal of one metric tonne of carbon dioxide from the atmosphere, can be bought or used by companies and people to offset their carbon impact. These initiatives include capturing methane gas from farms, landfills, and abandoned coal mines, as well as wind energy and forestry initiatives. The organisations implementing these various services sell carbon offset certificates to other companies or individuals.

The issuance or authorisation of carbon credits, which can subsequently be bought or exchanged in compliance markets or voluntary markets, is one of the standard approaches of carbon finance. With the help of this financing instrument, carbon reduction becomes a marketable good.

Businesses that participate in compliance markets are given a set number of credits annually, representing the amount of emissions they are permitted for that particular year.



Companies have two options: they can adjust their business practices to lower their emissions for that year and then sell any extra credits they have to other businesses who require them, or they can choose to cash in these credits at the end of the year to offset their emissions. Large-scale industry's negative environmental effects can be lessened in this way.

THE ROLE OF THE STATE IN CARBON MARKETS

Until recently, the Government of India (Gol) had opted not to take a heavy hand in implementing or funding specific, targeted programmes around carbon finance, instead only engaging with related initiatives such as the Clean Development Mechanism (CDM) – the UN initiative that allows countries to fund emissions reduction projects in other countries and assign the carbon offsets to their own targets – as exclusively market-based mechanisms. Despite its initial successes, the collapse of the CDM, triggered by a "carbon panic" that saw the price of and pricing mechanisms for carbon credits crash in 2012, and the stop-and-start revival it has undergone since 2020 have understandably raised scepticism among government officials and experts alike. Alongside early CDM initiatives, the Gol did promote carbon market expansion in India through initiatives to improve capacity and the establishment of clear, open criteria for project approval, but the market remains fragmented, despite several attempts being made in the nation to increase capacity for aggregation and intermediation.

Likewise, very few Indian banks offer lending using a project finance model in the current investment environment, which would be well suited to take into consideration an extra revenue stream like carbon finance. The carbon revenue stream is frequently heavily discounted by Indian banks, in part because of their uncertainty or lack of understanding surrounding the carbon market, and they do not take Emission Reduction Purchase Agreements into account as collateral or guarantees to finance a project involving climatefriendly technologies.



As such, an intentional plan and concrete government policies focused on strengthening market infrastructure and widening access to the carbon market is advised given India's continued plans for significant investments in infrastructure, urban development, and industrialization while working to ensure access to energy for an additional 400 million people

Recognising this, the Gol recently passed the Energy Conservation Amendment (ECA) Bill, which "includes provisions for putting in place a carbon market." The ECA Bill seeks to use carbon credit mechanisms to reduce and mitigate emissions by setting renewable energy targets and requiring major consumers to use renewable energy sources to meet part of their energy requirements. As with other mandatory-compliance markets, if these major consumers are able to increase the amount of renewable energy they use and exceed their stated targets, they will be given carbon credits; on the other hand, if they are unable to meet their targets, they will face financial or other penalties or purchase carbon credits to cover the difference. There will also be a voluntary component to the carbon markets, which should open up additional funding for the development and implementation of clean technologies and other emissions-reduction initiatives. Importantly, the ECA Bill states that carbon credit exchange within India will be prioritised in order to help the country meet its NDCs. In certain cases, however, the Gol and its National Designated Authority may authorise excess credits to be sold outside the country. Taken as a whole, the ECA Bill - which includes other provisions to reduce usage of fossil fuels, establish a greener Energy Conservation Sustainable Building Code, and expand and energy consumption standards for vehicles and other industries - should be a massive step forward in greening the Indian economy and industry.

Given the CDM's recent revival and successful implementation of projects in China, South Africa, Mexico, and others, there is an argument to be made that greater state involvement and promotion in CDM projects going forward may be one of the best opportunities to boost rural incomes and simultaneously improve the environment.



One example of this can be seen in utilizing the CDM for the conversion of marginal farms to forests. Given that managing tree plantations require less work than managing yearly cropping operations, CDM afforestation may lead to a discharge of agricultural labour. Rural residents may see an increase in income as a result of rising labour demand attributable to farmers' diversification of in-kind payments, which now include fuelwood and tree foliage. Additionally, it would lessen the financial effects of crop loss brought on by water scarcity. According to a study of the implementation of a similar initiative in Uzbekistan, while a farm's short-term annual profits would decrease under the CDM scenario due to decreased water availability, incomes of both farmers and rural households would ultimately increase as a result of increased harvesting of non-timber products and changes in cropping patterns toward higher-yielding agricultural crops. They suggested that after the tree harvest, replacing coal with fuelwood would lower energy costs and CO2 emissions for rural homes. Households would be able to spend less on fairly expensive animal feed and home energy due to changes in the payment structure. It is expected that the modest size and spatial dispersion of these farms will raise the transaction costs associated with CDM initiatives. However, the World Bank advises that for a nation the size of India with such a complex ecosystem, the biologically acceptable definition of forests should vary by ecoregion and consider the climatic, geographical, and biological traits of natural forests that are typical of the region. In doing so, the state can play a role in facilitating this reconceptualization, thereby further enabling the carbon finance market. Other CDM projects can facilitate renewable energy infrastructure development and both public transportation and private electric vehicles, among others.

While experts remain divided on the long-term feasibility of the CDM as a whole, and India's participation and utilisation will require integration and cooperation with the GoI's own efforts at establishing carbon markets as laid out in the ECA Bill, there is substantial potential for emissions reduction in this sector.



PRIVATE SECTOR AND CARBON FINANCE

Carbon finance provides an opportunity for broad financial leverage in the sense of its expected range of deployment. For example, cutting-edge programmes benefit from carbon finance because it creates a new revenue stream and facilitates the efficient transfer of technologies, know-how, and expertise.

Increases in revenue along with greater risk endurance in the carbon market through private participation will lead to more competitive prices on the credits. Due to the tight net zero targets in India and globally, it is important to increase the scale of investments in the carbon market. One means of doing so would be to further encourage the private sector to co-create a platform of its own – a forum of small and medium enterprises who can come together to become eligible for trading. This can help them in mobilizing together to negotiate, trade and expand the carbon trading market.

Carbon Credits in Agriculture

One of the case studies which can be evoked here is FECCEG's business model integrating carbon credits into its coffee production collective. The FECCEG – short-form for the Federación de Café Comercializadora Especial de Guatemala, or the Specialty Coffee Trade Federation of Guatemala – encourages its producer members to use organic and sustainable farming and processing methods. By not using conventional fertilizers, farmers are able to improve carbon dioxide fixation in the soil and lower nitrogen emissions and producing organic coffee within this sustainable agroforestry system can further capture carbon dioxide that is released into the atmosphere The FECCEG is then able to sell certified carbon credits that further fund this project: in short, companies or individuals can purchase carbon credits that fund the continued use of emissions-reducing and capturing techniques in the coffee industry. 2014 saw the first carbon transaction happen via the reseller CeroC02.



At a cost of \notin 7.20 per tonne, two Spanish companies purchased 1,159 tonnes of carbon offsets, or almost 40% of the total amount of 2,897.5 tonnes CO2e, resulting in a profit of \notin 7,900 (after bank fees). Adopting similar approaches and business models across India's varied agricultural sectors could see similar increases in revenues and reductions in emissions.

Carbon Credits and Electric Vehicles

Many nations, notably India, made the commitment to work toward net-zero emissions at the COP26 last year. One outgrowth of this has been in electric vehicles (EVs), which have been experiencing full-throttle transitions and growing market penetration, in addition to other steps required to reach net zero due to their near-zero emission potential. Nevertheless, despite ongoing technological advances and the increasing popularity of the products, the sector needs compelling efforts to fully realize its potential in generating carbon credits.

The EV sector generates carbon credits using two different methods: the CDM and voluntary carbon standards (VCS). While the existing methodology in VCS is utilised for project activities like charging station installation and related infrastructure, the available methodology in CDM is used for operating and/or charging of electric and hybrid vehicles for delivering passenger and/or freight transportation services. EV charging systems generate carbon credits by supplying renewable energy. Thus, owners of charging stations can increase their revenue from carbon credits and maximize their return on investment. If this potential is taken to scale, the market size will increase as carbon credits are monetized, and more companies will be incentivized to enter the market. Subsequently, more electric vehicles will be adopted as charging station deployment rises. The above cited reports also suggest that additional carbon credits from the EV industry can aid India in its efforts to electrify the transportation sector using cutting-edge technology by enabling it to export more credits and draw in more foreign direct investment.



This initiative can increase its chances of success with a strategic association with the central government. The centre has been empowered to venture into creating carbon trading schemes, which will enable the carbon finance market to flourish in all sectors, including the EVs. Nevertheless, greenhouse gas emissions are a consequence of the cumulative activities across industries. Instinctively, this would imply that all such activities shall be regulation of carbon crediting undertaken in the and financing. Notwithstanding the importance of expansion of the carbon credit market, a thorough review of the activities which can be certified as offsets must be regulated by a single central authority. This would become all the more crucial in the Indian context because India roots its agency not only as a developing country platform for global offsets, but also as an emitter who needs to offset locally.

CRITICISM AND CONCERNS SURROUNDING CARBON MARKETS

While there is significant potential in carbon markets and offsets, the sector has sparked substantial debates among policymakers, scientists, and other experts in recent years. The most common criticism has been around naturebased carbon offsets, whether participation in these markets, by major international corporations in particular, is only a form of 'greenwashing', and a lack of standardised regulations.

Nature-based offsets most commonly take the form of tree-planting initiatives and have been routinely utilised and cited as environmentallyconscious efforts being taken by major emitting industries such as airlines and construction material producers. This was particularly true in early iterations of carbon markets. However, the number of trees planted, the years required for them to fully reach their carbon capture potential, land and water use concerns, and other issues have drawn serious criticism. Wealthier countries and private companies were able to buy land in developing countries for offsets which poses a threat to those countries' own development and to indigenous peoples and practices, increasing the risk of human rights abuses and excluding local and indigenous peoples from land management and conservation activities.



Regarding the claims of greenwashing, critics argue that carbon markets allow primary emitters to continue generating greater levels of emissions by purchasing shares of possibility, that is carbon credits at a scale that is not reflected in reality on the ground. Overestimations of the amount of emissions negated by a particular credit will lead to a net increase in overall greenhouse gases. Indeed, some earlier studies of the CDM and the UN's Joint Implementation initiative estimated that as much as 60-70% of their carbon credits do not represent meaningful net reductions in emissions. Likewise, polluters may forego any internal changes to reduce their emissions as they opt instead to purchase carbon credits, thus ensuring greater emissions in the long run when they outpace the benefits from the credits. Additionally, it is possible in some cases to purchase credits from projects which are more than a decade old, essentially funding a project that was already running while continuing to emit greater and greater levels of greenhouse gases.

Lastly, as the interest and participation in carbon markets continues to expand globally, a lack of standardised rules and regulations jeopardises the markets' potential and opens the door for intentional fraud or unintentional accounting mistakes. There have been some cases where offsets have been over-sold or double-counted, allowing two separate entities to claim the same credit. Differing standards and methodologies for estimating the actual emissions reduction value of credits may also lead to net increases in emissions overall.

While these criticisms are valid and in need of addressing, it is important to note that they are issues with the way carbon markets are structured and implemented, not necessarily with the concept of carbon credits in and of itself. Many market leaders and other key stakeholders have begun to address the regulatory issues and innovation and technological advances have begun to mitigate the issues arising from nature-based offsets.

CONCLUSION

The reaction to climate change has led to exponentially increasing participation in carbon markets. The incentives provided by the market mechanism envisioned in the CDM and other key initiatives have led to productive, strategic actions. Though some have been more effective than others, these issues are growing pains that can reasonably be expected in the development of any new financial sector. With that said, there is a recognised need for coordinated efforts between the state and private sector, and the limitations of the target-based approach cannot be dismissed. Streamlined and standardised mechanisms and methodologies will have to be formulated which will link the market and stakeholders. Ultimately, however, by closing regulatory loopholes, increasing innovation, and improving technological solutions, and ensuring visibility, participation, and inclusion of indigenous and at-risk peoples, carbon markets should become a necessary and beneficial component in the fight against climate change. With the passage of the ECA Bill and its provisions on establishing carbon markets, the GoI has taken important steps towards formalising and standardising mechanisms for carbon finance and ultimately reducing greenhouse gas emissions.

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