IJFANS INTERNATIONAL JOURNAL OF FOOD AND NUTRITIONAL SCIENCES
ISSN PRINT 2319 1775 Online 2320 7876
 UGC CARE Listed (Group -I) Journal Volume 11, S.Iss 07, 2022

An Analysis on Carbon Credits in Indian Perspective

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Abstract

The rising cost of fossil fuels is a major concern. It not only means these resources are becoming scarcer but also highlights the damage they cause to our environment, especially through increased greenhouse gas emissions. As a result, there's a growing interest in finding and developing alternative energy sources that are clean and renewable. Renewable energy is now being viewed as a preferable option compared to nuclear power, which poses risks of significant disasters. Carbon dioxide, a major greenhouse gas, traps heat that would otherwise escape into space, leading to worldwide heating. There is a worldwide push to reduce emissions of carbon, with one of key strategies being the use of Carbon Credits. This concept, derived from the Kyoto Protocol, aims to regulate greenhouse gas emissions by allowing the trading of carbon credits among countries and governments. This paper will explore carbon credits as an alternative approach to reducing emissions of carbon.

Key Words: Carbon emissions, , Renewable resources, greenhouse gases, Carbon Credits

Introduction

One of the biggest problems facing the world today is climate change, often called global warming. This is happening because the Earth's temperature is rising due to gases like carbon dioxide trapping heat. Human activities, like burning fossil fuels, have released a lot of these harmful gases into the air. The effects of climate change will be different in different places, and these gases stay in troposphere for a long time.

To reduce these harmful gases, people have come up with carbon credits. These are like permits that allow someone to release a certain amount of carbon dioxide or other similar gases. One carbon credit is equal to the amount of carbon dioxide a car might produce driving about 2,400 miles. To understand how much carbon dioxide someone or something produces, we measure their carbon footprint. This shows the total amount of carbon dioxide released in a year.

Breaking down 'Carbon Credit'

The carbon credit arrangement relies heavily on governments and regulatory bodies, which are responsible for setting limits on the total amount of carbon dioxide emissions. A carbon credit serves as a permit that authorizes the holder to emit a specific amount of carbon dioxide over a set period. However, carbon credits are not solely about limiting emissions; they also involve trading. Through this trading mechanism, companies or countries can trade carbon credits to help balance global emissions, contributing to an overall equilibrium in the emission levels.

An example of Carbon Credits Trading

In the carbon emissions program, a company that remains below its emissions limit can sell any extra carbon credits to another company that exceeds its cap. For instance, if both Company A and Country B have a 10-ton emissions limit, and Company A emits 12 tons while Country B emits only 8 tons, Country B has a surplus of 2 tons. Company A can purchase these 2 extra tons from Country B to offset its excess emissions. If Company A does not acquire these surplus credits, it will face penalties. Thus, if the cost of buying the surplus credits is less than the penalties, Company A will likely opt to purchase the credits. However, if the price of the credits exceeds the fines and penalties, Company A might choose to pay the fines instead.

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Objectives of the study:

To explore the growth of the carbon credit market in India.

To pinpoint the major participants in India and their activities.

To assess the challenges or issues faced by India in the carbon credit market.

Literature Review

Mr. Dhaval Sharma observed that the Kyoto Protocol, introduced in 1996, was an international policy designed to cut greenhouse gas (GHG) emissions. This initiative has prompted gradual measures to set limits on carbon emissions, including establishing carbon markets where companies can trade emission allowances. India signed the Protocol in August 2002 and has since become a global leader in cutting greenhouse gas emissions by actively applying Clean Development Mechanisms (CDMs) in recent years.

Forest MSW (2005) stated that wood is a competitive material compared to others, with timber from plantations showing strong performance relative to alternative materials. A study revealed that timber can absorb up to 15 times more carbon than what is released during its production. The emissions from manufacturing different construction materials vary, with the aluminum and copper industries being the largest contributors of CO2 due to their production processes.

Wara (2008) highlights that global warming is a critical and complex environmental issue for the international community. The Kyoto Protocol is the most significant initiative aimed at addressing climate change. To tackle this global issue using market-based mechanisms, the international market launched the Clean Development Mechanism (CDM). The CDM allows sellers in developing countries to generate and certify emissions reductions, which are then sold to buyers in developed countries.

S. Robert (2008) observed that there is currently no comprehensive policy in place to reduce carbon dioxide and other greenhouse gas emissions, and most past research has focused on Western countries.In response to the growing concern about global warming, many nations worldwide are beginning to address the issue more seriously. There is a recognized need to develop a structured policy that ensures equitable distribution of emission allowances, which could also positively impact national economies.

Doran (2007) emphasized that human activities are causing harmful climate changes by emitting greenhouse gases (GHGs) into the atmosphere. To avoid severe and potentially catastrophic effects on the environment, economy, and health due to rising global temperatures, it is crucial for everyone to work on reducing and managing GHG emissions.

B. Robert (2009) noted a broad consensus on climate warming, observing that air and ocean temperatures are increasing, snow and ice are melting, and sea levels are rising. Additionally, natural systems are being impacted, with shifts in plant and animal habitats towards the poles and changes in fish and algae populations due to warmer ocean temperatures.

Chen and Wang investigated the factors affecting the price of carbon emission rights and found that government policies exert the greatest influence**.** Weather conditions can impact fossil fuel demand, thereby affecting both the demand and price of carbon emission rights. For instance, colder weather boosts fossil fuel consumption and carbon emissions, leading to higher prices for emission rights, whereas warmer weather reduces these demands.

In an empirical study, Maria Mansanet-Bataller, Angel Pardo, and Enric Valor found a strong positive correlation between weather and the price of carbon emission rights. They observed that colder weather increases fossil fuel consumption, which in turn raises the price of emission rights.

Alberola, Chevallier, and Chèze observed that while hot weather had little effect on the

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price of emission rights, extremely cold weather had a significant impact**.**

Methodology

This paper employs an exploratory approach. Exploratory research is conducted when a topic has not been thoroughly examined, with the goal of setting priorities, developing operational definitions, and refining the research design. The data for this study were collected from secondary sources such as websites and news articles.

Analysis

As of 2015, India was the third-largest global emitter of carbon dioxide, with emissions totaling 2,407 million tonnes. By 2020, it was projected to account for 6% of global greenhouse gas emissions. Although India ratified the Kyoto Protocol in 2002, it was not obligated to meet any mandatory reduction targets as a developing country. In 2009, India voluntarily aimed to reduce the emissions intensity of its GDP by 20-25% by 2020, relative to 2005 levels. The 2008 National Action Plan on Climate Change (NAPCC) outlines India's climate policy framework, detailing eight national missions for 2017. These missions focus on enhancing energy efficiency, advancing solar technology, promoting sustainable urban development, managing water resources, protecting Himalayan ecosystems, expanding the "Green India" initiative, supporting agriculture, and fostering strategic knowledge development. India's 'Perform Achieve and Trade' (PAT) scheme was in its initial phase from 2012 to 2015, serving as a pilot period.

PAT aims to improve energy efficiency and cost-effectiveness in energy-intensive industries. The scheme sets specific energy efficiency targets for these large industries, imposing penalties on those that do not meet the targets. Conversely, industries that exceed their targets receive incentives in the form of energy saving certificates. These certificates are tradable and can be purchased by industries that fail to meet their own targets.

The Clean Development Mechanism (CDM) established by the Kyoto Protocol allows developing countries to receive financial benefits from projects that are environmentally beneficial. India is the second-largest user of this mechanism, following China, to reduce its carbon emissions. The main goals of the CDM are:

Helping to stabilize and reduce the levels of greenhouse gases (GHGs) in the atmosphere;

Assisting industrialized nations in achieving their emission reduction goals under the Kyoto Protocol in a cost-effective and efficient manner.

Promoting the involvement of the private sector in developing countries in efforts to reduce emissions.

Brief History & Recent Developments

Timeline	
2002	Energy Conservation Act enters into force
2005	Kyoto Protocol comes into force for India on 16 February 2005
2008	National Action Plan on Climate Change (NAPCC) policy instated
2008	National Mission on Enhanced Energy Efficiency (NMEEE) approved
2009	National Mission on Enhanced Energy Efficiency (NMEEE) approved
2009	The PAT (Performance, Achieve and Trade) scheme introduced
2009	India signs voluntary Copenhagen target of 20-25% emissions intensity reduction relative to 2005 levels by 2020
2010	Levy on coal introduced
2010	Energy Conservation Act amended to allow trading in energy saving certificates
2011	India's pilot ETS is unveiled
2012	PAT first compliance period begins (2012-2015)

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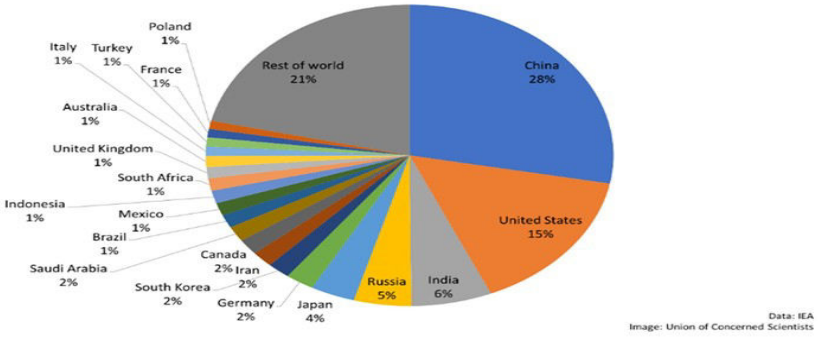
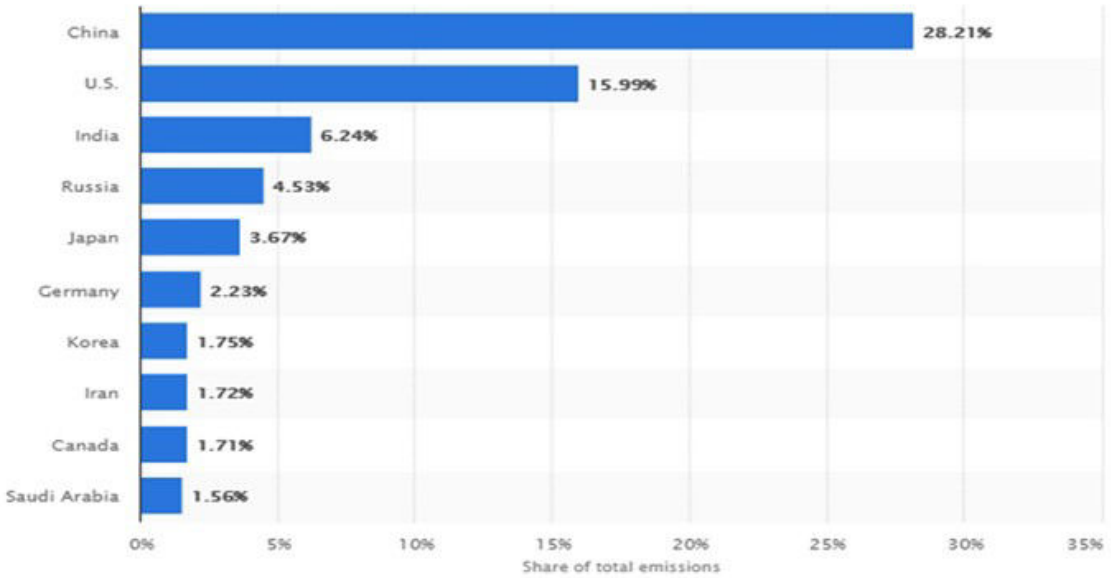


Supporting developing countries in achieving sustainable development to ensure that their resources are not depleted. Global CO2 emissions producers in 2015, based on global share, are:

Source - https://www.ucsusa.org/global-warming/science-and-impacts/science/each-countrys-share-of-co2.html#.XCC3ZdIzbIU

The image shows that both developed nations, such as the USA and Russia, and developing countries, like India and China, are major contributors to global carbon dioxide emissions. While developed countries tend to have higher per capita emissions, developing nations may have higher total emissions due to less advanced technologies and practices. In 2016, the distribution of carbon dioxide emissions globally, based on their share of total CO2 emissions, was:



Source -https://www.statista.com/statistics/271748/the-largest-emitters-of-co2-in-the-world/

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In 2016, the largest producers of carbon dioxide were the United States and three BRICS nations: Russia, India, and China, with China leading as the top emitter. There are several measures that can be adopted to reduce carbon dioxide and similar gas emissions, including:

- Reforestation and tree planting
- Composting livestock waste
- Reducing fossil fuel use in energy production
- Transitioning to renewable energy sources

The US is also a significant producer of wind and solar energy as part of its renewable energy strategy. Data shows that India's carbon emissions rose from 6% to 6.24% of global emissions

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between 2015 and 2016.

Indian Companies in the Top 200 Clean Energy Firms

Seven Indian companies are listed among the top 200 global firms based on revenue from clean energy. Suzlon Energy is ranked 68th for its wind farms. Bharat Heavy Electricals Ltd (BHEL) is 106th for its wind turbines and solar cells. Tata Chemicals is 114th for its biodiesel, fuel cells, and solar energy solutions. Thermax Ltd is 139th for its vapor absorption chillers that use water as a refrigerant instead of ozone-depleting chemicals. Exide Industries is 153rd for its electric storage batteries. IDFC Ltd (Infrastructure Development Finance Company) is 155th for its green infrastructure financing, and Havells India is 166th for its energy meters. Godrej Industries, NHPC Ltd, SJVN, and Bharat Electronics have been removed.

World Rank	Name of company	Type of projects
68	Suzlon Energy	Wind farms
106	Bharat Heavy Electricals Ltd.	Wind electric generators and solar cells
114	Tata Chemicals	Chemicals for biodiesel, solar energy, and fuel cells
139	Thermax Ltd.	Vapour absorption chiller that uses water as refrigerant instead of ozone depleting chlorofluorocarbons
153	Exide Indus	Electric storage batteries
155	IDFC Ltd.	Green infrastructure financing
166	Havells India	Energy meters

Source: www.ibef. org

Challenges for India in the Carbon Credit Market

India is the third-largest global contributor to Clean Development Mechanism (CDM) projects and has earned a substantial amount of Certified Emission Reductions (CERs). However, there has been a recent decrease in demand for carbon credits and a significant drop in CER prices. Although these credits are traded internationally, India does not have a well-established trading system for them. Furthermore, the carbon credit system in India is not compulsory and is not mandated by Indian law. The government does not provide incentives to initiate or support green projects nor does it impose taxes on projects exceeding carbon emission limits. India also does not have specific emission targets under the Kyoto Protocol, which makes setting emission limits a significant challenge.

1. Loss of Competitiveness: Implementing and maintaining an emission reduction policy involves additional costs, which can lead to reduced competitiveness in the industrial sector. As a result, industries may find it unprofitable to operate within a regulated environment.

2. Carbon Emission Leakage: If industries perceive a regulated sector as unprofitable, they might relocate to unregulated areas, potentially causing emissions to leak from regulated to unregulated regions.

Ensuring Compliance: Effective enforcement of emission limits relies on regulatory authorities ensuring that rules are followed. If enforcement is weak, it can undermine market

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stability and lead entities to bypass regulations.

Cost: Setting up a carbon market incurs significant expenses related to market oversight, administration, and compliance. In India, these costs are particularly high due to the lack of mandatory reporting requirements for relevant authorities.

Conclusion

Although corporations have made notable contributions to the carbon credit system, small-scale industries, which are crucial to the Indian economy, could significantly enhance the green economy initiative. Providing subsidies for these industries to invest in solar power systems or adopt energy-efficient practices could lead to substantial progress in the Indian context. Additionally, issues related to plastics and e-waste are concerning. Recycling biodegradable materials like rubber and agricultural waste can help reduce carbon emissions, while recycling non-biodegradable items such as plastic—India being a major producer and consumer of plastic—can mitigate health problems and air pollution from burning plastic. Incentives should also be offered to industries involved in these recycling efforts. Moreover, reusing electronic items through minor modifications can reduce e-waste. Despite recent setbacks from the global economic recession, the carbon credit system holds great potential in India. It is crucial to assess India's contributions in terms of Certified Emission Reductions (CERs), greener projects, and events rather than just focusing on emission trading earnings. As a nation, India must actively participate in green initiatives, such as tree planting, which can be seen as grassroots environmental efforts. With effective monitoring, evaluation, and enforcement of carbon taxes on non-environmentally friendly projects, India can meet its clean and sustainable development objectives and move towards a greener economy.

Recommendation

India is the fourth largest emitter of greenhouse gases in the world in total emissions. However, when measured per capita, India's emission rate is 1.2 tons per person, which is substantially lower than the emissions in Western countries, where it averages around 20 tons per person.To reduce its carbon footprint, India could consider the following measures:

1. Transitioning from high-carbon fuels, such as coal, to lower-carbon alternatives, like natural gas.
2. Upgrading and improving controls and equipment to minimize carbon emissions.
3. Enhancing vehicle efficiency by incorporating new technologies.
4. Shifting vehicle fuel types from conventional fuels to electric or hybrid vehicles.
5. Refrain from burning crop fields after harvest and instead use manual pickers or machinery for gathering crops.
6. Set up compost pits to capture biogas from organic waste.
7. Gather methane from sewage and establish facilities for treating industrial waste.
8. Adjust industrial processes, products, and packaging to cut down on greenhouse gas emissions.
9. Implementing carbon offset strategies, which involve reducing emissions to compensate for emissions elsewhere, supporting renewable energy projects like wind, biomass, and tidal energy.
10. Engaging in tree planting and carpooling.
11. Adopting the three Rs—reduce, recycle, and reuse—to minimize landfill waste.
12. Although carbon credits are traded on the Multi Commodity Exchange of India (MCX), a comprehensive policy for carbon trading is still lacking. The central government has requested the National Commodity and Derivatives Exchange Limited (NCDEX) to develop a clear and effective policy framework for carbon credit trading.

Even minor adjustments by individuals could lead to significant improvements, especially

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with a population of 1.35 billion.

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