Carbon Credits: A Solution to Environmental Issues and Global Warming

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Abstract

The world is today facing its toughest difficulties due to environmental imbalances. For the betterment of humanity and the welfare of everyone on our "One Earth," there is a great need to create eco-friendly zones. Illuminating the social awareness idea in relation to the mitigation of environmental deterioration is urgently required. The new currency is called "Carbon Credits," and each carbon credit is equal to one ton of carbon dioxide that was either kept out of the atmosphere or prevented from being released. These days, carbon credits are a hot subject in high society and the business world, but they also apply to the average person who qualifies for credits based on his changed lifestyle and practices. Each individual may make a difference, according to "Patrick Gonzalez," a climate scientist at the Nature Conservancy, since one modest act of kindness multiplied by millions of times results in enormous advantages. In this essay, it is addressed and emphasized how a regular person may earn Carbon credits with the least amount of work. Along with a residential energy audit in the setting of India, the research looks at the lifestyles of residents in a few chosen villages.

Keywords — Climate change, Carbon footprint, Carbon offsets, Carbon credits, Emissions, Greenbelt, Greenhouse gases (GHGs), Sequestration, Sustainability

Introduction

The average temperature of the earth's atmosphere and seas are rising due to global warming. Earth's average surface temperature risen by roughly 0.8 °C . There is no doubt that the climate system is warming, and scientists are more than 90% positive that human activities like the burning of fossil fuels and deforestation are the main causes of the increase in greenhouse gas concentration. The average warming impact of naturally existing greenhouse gases is roughly 33°C . The main greenhouse gases are water vapor, carbon dioxide (9–26% of the greenhouse effects), methane (4–9%), and ozone (3–7%).

Today's climate change is mostly caused by population expansion. Because humans produce heat-trapping gases called green house gases (GHGs) into the atmosphere faster than the oceans and other living things can sequester them, human activity is basically causing a scale imbalance that is causing climate change. The use of fossil fuels since the late 1700s and the more than sevenfold rise in the population since then are to blame for this imbalance. The Scripps Institute of Oceanography's most recent on-site observations show that worldwide atmospheric carbon dioxide (CO 2) concentrations increased from 280 parts per million (ppm) in pre-industrial times to 409.65 ppm . 350 ppm is the

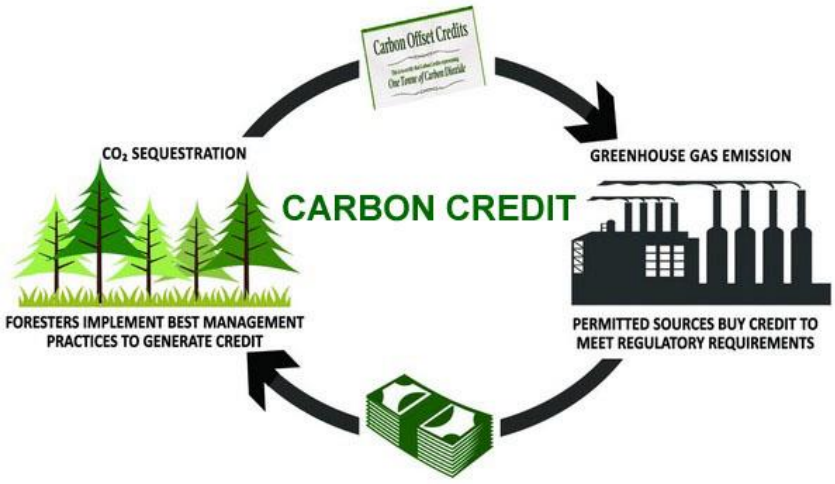
maximal safety limit for atmospheric CO2. Since early 1988, atmospheric CO2 levels have been over 350 ppm.

Carbon Credits:

Any transferable certificate or permit that represents the right to release one ton of carbon dioxide or the mass of another greenhouse gas with a carbon dioxide equivalent (CO2) to one ton of carbon dioxide is referred to as a "carbon credit" [5]. A 1997 international pact involving 169 nations, the Kyoto Protocol, gave rise to the concept of carbon credits. This is putting a price on the expense of air pollution. One metric ton of carbon dioxide, or 1,000 kilograms, is represented by one credit. This is either kept from emitting or removed from the atmosphere of the planet.

The notion of carbon credits came into existence as a consequence of increas-ing awareness and the necessity for environmental management. One of the consequences of the international accord between 169 nations known as the Kyoto Protocol was carbon credits. Legally binding emissions objectives for poor countries were established under the Kyoto Protocol. The government must restrict carbon dioxide emissions in order to achieve these goals. It became operational in February 2005.

At their present market price, carbon credits may be exchanged on the global market. These credits must be legitimate, based on science, and need proof. For instance, a group of environmentalists will get credit if they plant enough trees to cut emissions by one ton. A steel manufacturer may buy this carbon credit from the environmental organization if it expects to produce 11 tons of steel but only has a 10 ton emissions limit. By requiring that nations adhere to their emission limits and providing incentives for exceeding them, the carbon credit system seeks to decrease emissions.



Types of Carbon Credits:

There are two distinct types of Carbon Credits: Carbon Offset Credits (COC's) and Carbon Reduction Credits (CRC's). Carbon Offset Credits consist of clean forms of energy production, wind, solar, hydro and biofuels. Carbon Reduction Credits consists of the collection and storage of Carbon from our atmosphere through bio sequestration (reforestation, forestation), ocean and soil collection and storage efforts. Both approaches are recognized as effective ways to reduce the Global Carbon Emissions "crises".

Methodology

There are many methods to generate carbon credits, however there are two main categories:

1. Sequestration (the capture or storage of carbon dioxide from the atmosphere), such as planting and replanting trees.
2. Initiatives to reduce carbon emissions, such as the utilization of renewable energy. Calculating carbon credits simply involves calculating the carbon footprint of different activities.

There are two stages to this, including identifying the carbon footprint and calculating it.

Defining the carbon footprint in **Phase I**

According to GHG protocol boundaries are set for the each inventory for computing carbon footprint. Choosing the appropriate emission inventory for every activity.

Quantifying the carbon footprint in **Phase II** entails:

Gathering information about the emission sources from the indicated activities putting the data together and identifying the data gaps.

To ensure the quality and correctness of the job, double check and verify the data. assembling all pertinent unit conversion factors and emission factors in the database of emissions. transforming the consumption amounts for each source into a single unit that works with the supplied emission factors. Creating "inventory plan of management "to sum up the outcome. identifying the stocks that are responsible for excessive emissions. Offer workable solutions for lowering carbon footprints and obtaining carbon credits.

Review of Literature:

Gupta Ms. Yuvika (2016) has worked on The Carbon Credit: A Step towards Green Environment. She Said that the Global Warming is Costing a Lot of Money, So Green Environmentalist aims to Promote Policy and Business that Works for the Environment. As We all Know, Carbon Dioxide, The Most Important Greenhouse Gas Produced by Combustion of Fuels, has become a Cause of Global Panic. As its Concentration in the Earth's Atmosphere has been Rising Alarmingly. This has created an Opportunity for the Trade of Carbon Credits both within and Outside of the Regulated Area, Thereby

Creating a Global "Carbon Market". In this System of Carbon Trading, Controls are imposed on Greenhouse Gas (GHG) Emissions under the Kyoto Protocol, and the Pre-Decided Emission Limits are then allocated across countries, which have to control the Greenhouse Gas Emissions from the various Industries and Commercial Units Operating within them. Kumari, Divya, Revanth and L.Swetha (2013) revealed that an analysis on carbon credits (india).

Chopra (2016) have dealt with the Carbon Credit Market in India: Economic and Ecological Viability. They have revealed that Climate change is the greatest challenge threatening humanity at present. Global warming due to excessive release of toxic gases, pollution of ecological endowments are glaring examples of reckless human behaviour in pursuit of economic motives. It is call of the time for us to give back to Mother Nature. What all we have robbed her off and efforts are made world over to reduce the negative imprints as a priority call. To make stringent plan of action for environment protection the Kyoto Protocol was organized in 1997 where stakeholders from across the globe brainstormed a mechanism whereby it was decided to incorporate carbon (main green house gas) reduction endeavors with economic motives of enterprises to motivate sustainability efforts on their part.

L.Swetha (2017) revealed that an analysis on carbon credits (india). They have dealt with the effect of Carbon Credits on Stock Market and Investigate relative factors which Influence Stock Market in India. The following are the different determinates which we have considered Like Carbonex, Greenex, Powered, Msci, Population, Gold, Exports, Imports, IIP (Index of Industrial Production). In India Carbon Credit decision are taken by Kyoto Protocol under United National Frame Work of Climate Change (UNFCC). Any fluctuations on Population, Pollution, IIP, etc. will Impact on Carbon Credits.

Dr. Meghna (2018) worked on the Accounting for Carbon Credits in India. A Carbon Credit is a Generic Term for any Tradable Certificate or permit representing the right to einit one tonne of Carbon Dioxide or the mass of another Greenhouse Gas with a Carbon Dioxide Equivalent (Tco2e) Equivalent to one tonne of Carbon Dioxide. Carbon Credits and Carbon Markets are a Component of National and International Attempts to mitigate the growth in concentrations of Greenhouse Gases (GHGs). The Quality of the Credits is based in part on the validation process and sophistication of the fund or developments company that acted as the sponsor to the Carbon Project. This is reflected in their Price; Voluntary units typically have less value than the units sold through the rigorously validated 'Clean Development Mechanism'.

Objective of Study:

1. To study the United Nations Framework Convention on Climate Change

   Kyoto Protocol
2. To study the Indian scenario in carbon trading
3. To study the harmful effect of global warming and its solution

United Nations Framework Convention on Climate Change: Kyoto Protocol

The idea of sustainable development was introduced during the UN conference on the environment and development in 1992 in Rio de Janeiro, Brazil, as a reaction to the catastrophe caused by global warming. At this summit, the "United Nations Framework Convention on Climate Change," or UNFCC, was created by more than 150 nations. This is the first convention to fully restrict greenhouse gas (GHG) emissions, including carbon dioxide, and to combat global warming, which has a negative impact on societal and economic growth. The primary goal of the third meeting of the parties under the UNFCC, which took place in Kyoto, Japan, in December 1997, was to reduce carbon emissions in industrialized nations. The Kyoto Protocol was agreed upon as the meeting came to a close. In February 2005, this procedure becomes effective. This pact will compel nations to cut their greenhouse gas emissions since it is legally enforceable on a global scale. Ground-breaking ideas like carbon credits, carbon footprints, and emissions trading have been established via this protocol. Mechanisms for Reducing Emissions and

Conserving Energy Three strategies for energy saving and emission reduction were developed under the Kyoto Protocol:

Three strategies for energy saving and emission reduction were developed under the Kyoto Protocol:

- The Clean Development Mechanism (CDM),
- Joint Implementation (JI), and
- Emissions Trading (ET)

(I) Clean Development Mechanism, first (CDM) One may negotiate a transaction for carbon credits under the CDM. Any developed-world corporation may partner with a company in a developing nation that has ratified the Kyoto Protocol under the terms of the UNFCCC charter. These businesses in emerging nations must embrace more modern technology, generate fewer emissions, and use less energy. Under CDM, only a fraction of the company's overall carbon credit revenue may be transferred to the revenue of developed nations. In Europe, the amount of credit that businesses may purchase is capped.

(II) Joint Implementation (JI) The mechanism known as "joint implementation," defined in Article 6 of the Kyoto Protocol, enables a nation with an emission reduction or limitation commitment under the Kyoto Protocol (Annex B Party) to acquire Emission Reduction Units (ERUs), each equivalent to one ton of CO2, from an emission-reduction or emission removal project in another Annex B Party, which can be used to reach its Kyoto target. While the host Party gains from foreign investment and technology transfer, joint implementation gives Parties a flexible and economical way to meet some of their Kyoto obligations.

(III) Trading Emissions (ET) The Kyoto Protocol's Annex B Parties are nations that have committed to limiting or lowering their emissions. These goals are stated as levels of permitted emissions, or "assigned amounts," for the commitment periods of 2008–2012. "Assigned amount units" represent

the division of the permitted emissions (AAUs). According to Article 17 of the Kyoto Protocol, emissions trading enables countries with emission units to spare—emissions that are authorized but not "used"—to sell their extra capacity to nations that have exceeded their objectives.

Role of India in Carbon Trading:

India is starting to take a significant role in the market for carbon credits worldwide. Originator, developer, and dealer of carbon credits were encouraged by this to open an office in India. The field of carbon credit is rapidly expanding right now, notably in India, yet relatively few corporations are aware of it. The need to raise awareness of this industry is very critical. India is allowed to sell excess credits to industrialized nations since its GHG emissions are below the goal. India is thought to account for 31% of global carbon trade, which could generate $25 billion by 2010. Trading in carbon credits is a fantastic business opportunity because of this.

Foreign businesses who are unable to adhere to the rules might purchase excess credit from international businesses. Numerous Indian corporations have had their stock ratings revised in light of the windfall that will come their way once carbon trading begins. Shell Trading International and SRF Ltd have agreements in place for the selling and purchase of credit for reducing emissions. Both Suzlon Energy and Shriram EPC operate in the wind energy sector and may take advantage of carbon credit advantages. Carbon credits are also anticipated to be advantageous for Shree Renuka Sugars. One of the first businesses to register for a Clean Development Mechanism (CDM) project was Gujarat Fluorochemicals. More than 200 Indian organizations have sought to register their CDM Project in order to get carbon credits, making India the underdog in this race. Additionally, the 800 million farmers in India have a rare chance to make money by selling carbon credits to industrialized countries. Due to the employment of regenerative braking systems in its rolling stock, India's Delhi Metro Rail Corporation (DMRC) has become the first rail project in the world to get carbon credits. By utilizing regenerative braking systems on its trains, which lower power use by 30%, DMRC has amassed the carbon credits.

The harmful effects of global warming for environment

Living conditions and the desirable ways that creatures live depend on a healthy and suitable environment, and any manipulations and harmful attacks on nature could result in undesirable conditions for living, which would then result in damage to the environment. These environmental harms are a direct result of improper use of the energies that are all around us.

Human causes include processes like making cement, clearing forests, and burning fossil fuels like coal, oil, and natural gas. Since the Industrial Revolution, human activity has significantly increased the atmospheric carbon dioxide content, which has now increased to hazardous levels not seen in the past three million years. Although carbon dioxide emissions from human sources are substantially less than those from natural sources, they have broken the natural equilibrium that prevailed for many thousands of years prior to human influence. This is true because the amount of carbon dioxide removed from the atmosphere by natural sinks is about equal to the amount of carbon dioxide created by natural sources [4]. It had managed to maintain stable and safe levels of carbon dioxide.

However, since carbon dioxide from human sources of emissions is being added to the atmosphere rather than being removed, the natural equilibrium has been disturbed.

Reviewing the CO2 sources that human sources of carbon dioxide emissions have been expanding ever since the Industrial Revolution. The main contributor to the rising carbon dioxide concentrations in the atmosphere is human activity, namely the burning of fossil fuels like coal, oil, and gas, as well as deforestation. The burning of fossil fuels is the main source of carbon dioxide emissions produced by humans. 87% of human carbon dioxide emissions are produced by is. The energy released when these fuels are burned is often converted into heat, electricity, or power for transportation. They are used, among other places, in automobiles, aircraft, and industrial buildings. The fossil fuel with the highest carbon content is coal. Approximately 2.5 tons of CO2 are created for every ton of coal burnt. 7 Coal is the main fossil fuel source of carbon dioxide emissions due to its extensive usage. There are carbon dioxide emissions associated with anything that uses fossil fuels. Therefore, burning these fuels produces carbon dioxide as a by-product in addition to energy release. This is so that practically all of the carbon that is stored in fossil fuels may be converted to carbon dioxide. It's crucial to remember that the three primary economic sectors that rely on fossil fuels are transportation, industry, and electricity/heat. 8 It's preferable to realize that carbon dioxide and carbon monoxide, another odourless combustion by product that is very harmful to both people and animals, should not be mistaken. Buildings must be adequately vented to protect residents from dying from furnace or replacement part emissions, not carbon dioxide or CO2.

Significant volumes of CO2 are also released by volcanoes and deep marine vents. They were, in fact, the primary producers of the CO2 that aided in the beginning of life on earth. El Nio and La Nia, two recurring shifts in ocean current patterns in the southern tropical Pacific, also have an impact on carbon dioxide levels. El Nio has scientific implications since it heats the oceans, which then emit large volumes of CO2 into the atmosphere. 7 Defra UK (2014) The 2014 Government Greenhouse Gas Conversion Factors for Company Reporting. Department of Environment, Food, and Rural Affairs, United Kingdom, London. 8 International Energy Agency Fuel Combustion CO2 Emissions (2012) The Organization for Economic Cooperation and Development is based in Paris. La Nia occurrences chill the oceans and make them more receptive to CO2, which promotes the development of marine algae.

Solution for global warming:

Since the negative effects of global warming on the environment have been made evident, we should also explain and suggest potential solutions for dealing with this significant problem. We may lessen the hazards associated with climate change by making decisions that lower the quantity of greenhouse gas emissions and by preparing for the changes.

We have a number of options for combating global warming.

- One solution is to stop producing CO2. By moving to renewable energy instead of oil, coal, and gas, we can achieve this. Planting more trees is the next option. The oxygen that trees create and consume is not a greenhouse gas.

- Using less energy and recycling more items is an additional suggestion. The temperature of the world may not increase much if we consume less energy and are more ecologically conscious. Naturally, the remedies focus on limiting the discharge of these dangerous gases: One solution to this problem is to reduce the use of fossil fuels, but since there is no way to do that, humanity should use one of the fuel sources that are currently available. The second solution is to use alternative energy and clean energy sources, but those solutions are not cheaper.
- The third solution is to use CCS technology, which will simultaneously capture and store CO2 as it is released into the atmosphere.

It's important to note that by adopting viable renewable energy and efficiency solutions at the municipal, state, and federal levels, we can prevent the worst effects. Numerous of these solutions provide instant extra benefits, such as lower energy costs for consumers and cleaner air and water. To stop the worst effects of global warming, we must start implementing these remedies right now. To combat the issue of global warming, we must work cooperatively to manage the area around our own homes. We must locate a location in the rainforest to grow trees. We need to start with our own home. While gardens are essential for our survival, we also need to find alternative ways to cover as much of a building's surface as we can. Jungle management must be our main focus. Because dry trees cause re, which not only destroys green trees but also results in the release of harmful gases, recycling of the trees in the jungles is crucial. Governments must deal with the management of jungles, but everyone of us may take care of our immediate surroundings. We should also cut down on our use of power. Because they are currently too costly to be employed on a large basis, solar and wind energy. In order to address this issue, the majority of the states have suggested the methods shown in bold; some of these were previously discussed, and I'm included them again to provide more clarification: The Great Lakes region of the globe now has a requirement for renewable electricity, which has significant economic and environmental benefits.

- Increased Clean Energy Funding: To provide a steady stream of public funds for energy management initiatives, the fund should be backed by a kilowatt-hour levy on consumer bills.
- State Residential Energy Efficient Building Code: This code, which would result in energy savings for consumers and aid in reducing greenhouse gas emissions, should be adopted by law.
- Promoting Cleaner Burning Fossil fuel generation: convincing people to use heat and power together to generate both heat and electricity for a facility or the neighbourhood. Lighting that uses less energy
- Finally, adopting tiny lifestyle adjustments today will help us avoid making major ones later. To defeat this grave danger, scientists, governments, and citizens must cooperate.

Conclusion

The residential sector has been recognized as a possible source for large reductions in greenhouse gas emissions in several national and international studies. The level of government engagement, as

well as specific social, technological, and economic restrictions, determine the magnitude of the anticipated reductions. One may learn more about the specifics of how inventories impact emission levels in the current case study, assisting everyone in understanding how and to what degree each human activity affects environmental changes. The pricing system's "carbon credits" automatically calculates the "carbon footprint." Although consumers would still be unable to determine how much of the cost is attributable to carbon emissions, they would be able to make judgments knowing that they are covering the social cost of their carbon footprint. The present situation of growing CO 2 levels in our own biosphere makes the study's scope very pertinent.

For a community to be happy, peaceful, healthy, and productive, sustainability in the living environment necessitates a paradigm shift to ecologically friendly habitats based on prudent energy and resource usage. The general people and volunteer organizations must take the initiative to stop such pollution in the absence of essential government regulation. This may be accomplished through raising environmental consciousness among diverse social groupings. By following the best energy and climate-saving advice, anybody can reduce their carbon emissions and qualify for carbon credits. A "green" manner of living must be adopted. Think green, plan green, and act green using the seven Rs: Retire or refrain, which is another way of saying reject something; reduce; recover; repair; reuse; recycle; and rethink. Avoid over-feeding, over-breeding, over-plowing, over-grazing, and over-felling to avoid resource exploitation.

Any global agreement on carbon emissions would establish a carbon limit low enough to compel the majority of countries to reduce their usage of fossil fuels in accordance with a specified norm. In the concept of carbon trading, if a nation stays within its emissions limit, it obtains carbon "credits," which may subsequently be sold to other countries that have already exceeded their limit or anticipate doing so. As governments scramble to get a license in order to exceed their carbon quotas, avoid paying fines, and prevent industrial output from being curtailed, this regulatory system will progressively increase demand for carbon credits. If such regulatory restrictions are implemented and enforced by states or supranational agencies, demand for carbon credits will soar.

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