



Carbon Credits- A Solution to Global Warming

Ingole S. P.

Department of Environmental Science, Shri Shivaji Science College, Amravati

Nagpurkar A. G.

Department of Environmental Science, Shri Shivaji Science College, Amravati

Kakde A.U

Department of Environmental Science, Shri Shivaji Science College, Amravati

ABSTRACT

Global warming is the rise in average temperature of earth's atmosphere and oceans. Earth's mean surface temperature has increased by about 0.8°C. Warming of the climate system is unequivocal and scientists are more than 90% certain that it is primarily caused by increasing concentration of greenhouse gases produced by human activities such as burning of fossil fuel and deforestation. A carbon credit is generic term for any tradable certificate or permit representing the right to emit one tons of carbon dioxide or the mass of another greenhouse gas with a carbon dioxide equivalent to one tons of carbon dioxide. In modern time the burning of fossil fuels like coal, oil and natural gas in which carbon has been stored for millions of years combined with accelerated land clearance has led to exceptional levels of greenhouse gas emissions. The carbon credit is one of the outcomes of Kyoto protocol, an international agreement between 169 countries. Carbon credits create market for reducing greenhouse gases emission by giving a monetary value to the cost of polluting the air. This means that carbon becomes a cost business and it seen like other inputs such a raw materials or labor.

KEYWORDS: Air pollution, Global warming, Carbon emission, Carbon trading.

Introduction

Global warming is the rise in an average temperature of earth's atmosphere and oceans. Earth's mean surface temperature increased by about 0.8 °C (1). Warming of the climate system is unequivocal and scientists are more than 90% certain that it is primarily caused by increasing concentration of greenhouse gases produce by human activities such as burning of fossil fuel and deforestation (2-5). Naturally occurring amount of greenhouse gases have a mean warming effect of about 33°C (6). The major greenhouse gases are water vapor, carbon dioxide which cause 9-26 %, methane which cause 4-9 %, ozone which cause 3-7 % of the green house effects (7, 8, 9).

A carbon footprint has historically been defined as "the total set of greenhouse gases emissions caused by an organization, event, product or person" (10). Greenhouse gases can be emitted through transport, land clearance, production and consumption of food, fuels, manufactured goods, materials, wood, roads, buildings and services (11). The main influence of carbon footprints includes population, economic outputs and carbon intensity of the economy (12). The burning of fossil fuels is a major source of greenhouse gas emissions (13, 14).

A carbon credit is generic term for any tradable certificate or permit representing the right to emit one tons of carbon dioxide or the mass of another greenhouse gas with a carbon dioxide equivalent to one tons of carbon dioxide (15). The concept of carbon credit came into existence as a result of increasing awareness of the need for controlling emissions. IPCC (Intergovernmental Controlling on Climate Change) has observed that policies that provide a real or implicit price of carbon could create incentives for producers and consumers to significantly invest in low greenhouse gases products, technologies and processes. Such policies include economic instruments, government funding and regulation (16).

The concept of carbon credits came into existence as a result of increasing awareness and the need for pollution control. Carbon credits were one of the outcomes of Kyoto protocol, an international agreement between 169 countries. The Kyoto protocol created legally binding emission targets for developing nations. To meet these targets, the nation must limits carbon dioxide emission, It was enforced from February 2005 (17).

Social cost analysis of atmospheric carbon is done by many researchers.

In life cycle model of cost analysis, discussion of how to account for changes in carbon contents of various wood products in India, classified into the retention periods that are Very short, Short, Medium and Long (18). It is well known that introduction of carbon credits can influence the rotation periods (19).

Carbon credit has been given the recognition of an intangible commodity and can be traded on the commodities market. Trading of carbon credit happens in the form of Carbon Emission Reduction (CER). A CER is given by the CDM executive board projects in developing countries to certify that they have reduced greenhouse gases emissions by one tons of carbon dioxide per year (20).

The carbon credit market is the fastest growing market in the world. The volume of carbon credits sold by developing countries doubled between the year 2003 - 2004 and tripled by 2005. In 2006 alone, carbon transaction worth USD 30 billion (INR 1.19 trillion) were conducted globally (21).

2007 carbon market shows china's share at 61% and India at 12%. In terms of total CER's issued of 166 million, India has 43 million. In 2008, china's share at 23% and India at 30% in terms of number of projects and 36% and 25% in terms of number of CER's issued respectively (22).

The recommended approach to measure carbon sequestration in LUEF projects is to use permanent sampling plots to monitor both the baseline and project. Well established statistical techniques can be used to determine the sampling design and intensity required to achieve a given level of precision (23). Larger projects may also benefit from imaging techniques and remote sensing based either on satellites or low flying airplanes (24). The level of precision to which each carbon pool can be measured at reasonable cost is presented (25).

Carbon credits an efficient mechanism to reduce the greenhouse gases emissions by monetizing the reduction in emissions (26). Rural India has tremendous potential to earn carbon credits by setting up household based energy substitution or fuel switching projects like biogas plants, solar cooker, solar cells, etc. (27). Carbon credit creates a market for reducing greenhouse gas emission become an internal cost of doing business and are visible on the balance sheet alongside raw materials and other liabilities or assets (28).

There is a great opportunity awaiting India in carbon trading which is estimated to go up to \$ 100 billion by 2010. In the new regime the country could emerge as one of the largest beneficiaries accounting for 25 % of total world carbon trade, says World Bank Report (29). According to industry estimates, Indian companies are expected to generate at least \$ 8.5 billion at the going rates of \$ 10 per tons of CER. Total Sponge Iron Ltd. Got a CDM certificate from the UN for its waste heat recovery project in Orissa and Reliance Energy already has energy efficiency and process development CDM projects (30).

Econometric studies use historic market response to changes that are analogous to a government carbon sequestration program to infer how landowners would respond to direct or indirect carbon prices (31, 32). In a tons year system, carbon credit would be awarded for the number of tones of the years and some equivalency factor would be defined to equate a specific number of tones year with permanent sequestration. Several approaches have been suggested for defining the equivalency factor i.e. the number of tons year that is to be equated with permanence (33, 34, 35).

Carbon leakages is not a problem concerned with carbon sequestration program alone as similar concerns surround the other greenhouse gases mitigation (36). To deal with lack of permanence of carbon credits a common approach has been either to acknowledge the same, assess the environmental and economic benefits of limited terms of sequestration and allot credits in proportion to time period over which carbon is sequestered (37).

Avoided deforestation is a reducing the rate of global deforestation. Forest mitigation activities would be highly cost effective (38). And same estimate have suggested that including avoided deforestation and other forestry action in climate stabilization policies could reduce overall cost by up to 50% (39, 40). Carbon credits for avoided deforestation could be defined and implemented and depends importantly upon the nature of the climate agreement subsequent to current Kyoto protocol (41).

Carbon sequestration by plants can partially offset the production of greenhouse gases from agriculture (42). The development of renewable energy projects assists in transition away from a carbon intensive economy (43). The amount of greenhouse gases offset are often calcu-

lated by using an average amount of emissions from each unit of electricity produced (44). The impact of energy efficiency project can range from large rebound effects to large amplification effects (45). Forestry project can effects level of soil carbon and it is estimated that amount of carbon held in the soil almost twice that held in the atmosphere (46). New Zealand study found that tree planting can give rise to large carbon sinks it can also leads to losses of mineral soil carbon which would need to be accounted for in offsets project (47). The apparent emission reductions from a forestry projects could leak out of another forest area (48).

Carbon credits takes contribution towards the fight against global warming, improves te returns on investments in projects, accelerates project implementation and boost economic feasibility of projects.

Conclusion

This paper is review of carbon credits. Most selling carbon credits so far includes renewable energy, energy efficiency measures in several sectors as well as the reduction of industrial gases that contribute to climate change. A carbon credit, licenses the owner to emit one tons of carbon dioxide in year. India also wants the developed world to fulfill its commitments for reduction of greenhouse gases, transfer new and additional technology to support adaptation and mitigation measures in developing countries. The real value of non-permanents carbon credits depends on two parameters namely future carbon price expectations and the investor's discount rate. Carbon credits an efficient mechanism to reduce the greenhouse gases emissions by monetizing the reduction in emissions. Rural India has tremendous potential to earn carbon credits by setting up household based energy substitution or fuel switching projects like biogas plants, solar cooker, solar cells etc... Carbon credit creates a market for reducing greenhouse gas emission become an internal cost of doing business and are visible on the balance sheet alongside raw materials and other liabilities or assets .

Carbon credits provides an incentives to reduce greenhouse gases effect emission on an industrial scale and are key components of national and international emissions trading schemes that have been implemented to mitigate global warming. This review paper includes the study of carbon credits and has helped industries to developed processes and technologies to minimize greenhouse gases emissions.

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