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A Review on Global Emission, Carbon Credit Market Mechanism and its Influence on Environment and Economy

Namitha Jois K S[1], Navitha Thimmaiah[2]

Abstract: Climate change is a burning issue in the present scenario. GHG emission is considered as a major cause for global warming which leads to change in climate pattern of the earth. In the present world, emission is considered as hindrance for environment as well as economic growth. On the other hand emission can be converted as a commodity to earn income in the world market. The article presents the brief review of the studies that reveals the condition of global emission and working of the carbon credit market in reducing global emission. The paper discusses the influence of emission on environment and economy and impact of carbon credit market to reduce those emissions and improve the economic condition through capital inflow especially to the developing countries of the world.

Evolution of Carbon Credit: An Overview

Climatic change is a major issue in the present scenario. It is rapid warming of the earth's climate by various activities. If it is left unchecked it will definitely pose unpredictable harm to human as well as to the whole eco-system. Emission of green house gases have greater impact on climate change. GHGs concentration rise global surface temperature, last decade considered as the warmest decade on the record and it there is increase in the temperature in every decade if we compare with the previous one. It not only creates illness but also makes difficult to work outdoor. Storms, droughts, cyclones, warming and rising ocean, desertification, lack of food production, poverty are the product of this climate change (United Nation Climate Action). Therefore it can be noted that climate change not only destroys the environment condition but also adversely affects the economy. Unless we are working on to find measure to reduce these emissions, there will be no solution to save the earth from destruction. To find solution to the dangerous outcome of climate change Kyoto Protocol emerged.

Kyoto Protocol

[1] Research Scholar, DOS in Economics and Cooperation, University of Mysore, Manasagangothri, Mysore

[2] Professor, DoS in Economics & Co-operation, University of Mysore

The Kyoto Protocol adopted throgh the United Nation Framework Convention on Climate Change (UNFCCC), it is an international treaty to reduce GHGs emission specifically 6 carbon dioxide equivalent that include carbon dioxide (CO_2), methane (CH_4), nitrous oxide(N_2O), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulphur hexafluoride(SF_6) mentioned by Kyoto Protocol as 'Kyoto Basket' which affect the atmosphere, overall it leads to increase in temperature known as global warming. Kyoto Protocol concept adopted in 1997 but entered into force from 2005.There were 192 parties signed to adopt Kyoto protocol and it is replaced by Paris Agreement afterwards.

The main concepts of Kyoto Protocol are carbon footprint and carbon credit.

Carbon footprint is an estimate that amounts emission in carbon dioxide and its equivalent emitted by a country, a business, an organization, an individual or another stakeholder is responsible for (UNFCCC). Carbon footprint has been considered as a product in present world and is being utilized by organization and countries to estimate their amount of carbon emission and adopt measures to reduce their emission. Carbon credits are tradable certificates utilized by the country or organization which is considered as a right to emit a certain amount of carbon dioxide and carbon dioxide equivalent. One Carbon credit means it is a certificate equal to reduction in one ton of carbon dioxide.

Countries ratified in Kyoto Protocol were assigned emission target for specific period have to participate in carbon trading if the country emits more than its assigned limit. Annexure 1 and 2 countries or economically developed countries assigned with target and each nation have their own specific target meet. The Kyoto protocol itself asks the countries to form their own policies and measures to solve the problem of climate change and were need to report about mitigation activities periodically. The protocol has annex based structure and only developed countries and puts heavier burden on them with emission reduction targets because they are recognized largely responsible for the high level GHG emission in the atmosphere compared to developing countries. The Kyoto Protocol has three mechanisms that enable the countries to meet their emission reduction target. They are:

1. **The International Emission Trading Mechanism:** Countries with excess emission units (carbon credits) that the limit permitted to them but not used can traded with other countries in carbon trading market who already crossed their emission limit
2. **The Clean Development Mechanism:** Countries with emission reduction target can invest in developing countries for emission reducing projects so that they can earn certified emission reduction (CERs) credit. This mechanism is called Clean Development Mechanism.
3. **Joint Implementation:** Two developed countries or parties jointing investing in emission reduction project or countries with emission reduction limit committing to earn emission units from projects in another country.

India is one of the major players in attracting CDM projects from developed countries as more than 200 Indian organizations have applied for registration of CDM Project to earn benefits of carbon credits. The millions community of farmers in India has opportunity where they can sell Carbon Credits to developed nations or on the other hand can availing funding for improved farming activities as they have less emission compared to other productive activities and which promotes emission reduction.

Paris Agreement

Paris Agreement replaced Kyoto Protocol in 2015 and it is adopted by 196 parties during UN Climate change conference in Paris and whose target were set to expire in 2020 (Jez Areta A et.al.) Its overall goal is to reduce the increase in global temperature to well below 2^0 C and above pre industrial level and limit the temperature increase to 1.5^0 C above pre industrial level. The Paris Agreement highlighted in the multi lateral climatic change and considered as important one because it is the first binding agreement that brings all the countries together to combat climate change. It also includes limiting the GHG emission from human activity to the same level as trees, soil and overall nature absorbs naturally which is known as 'Net Zero' between 2050 and 2100. The agreement paves the way for developed or richer countries to help low developed or poor countries by funding as 'Climate Finance' to implement climate change activities and replace with renewable energy. Paris agreement promote every country to set its

own emission reduction target and it need to be renewed every five year to raise ambitions (COP28 Summit, UAE)

Importance of carbon Credit Market

The India's Delhi Metro Rail Corporation (DMRC) is the first rail project in the world to earn carbon credits. DMRC has earned the carbon credits by using regenerative braking system in its trains by reducing 30% electricity consumption. (Jamal Arshad 2015). Like this Carbon is now treated as a commodity and it has value in the market. To trade these emission carbon trading market developed throughout the world. Developing countries like India, China, Brazil etc, are now open up with lot of investment opportunities by developed countries. Carbon footprint varies around the world and even the emission reduction target also differs among nations of the world. Therefore understanding the concept of carbon footprint, carbon credit and carbon credit market mechanism is very important to get best earning opportunities as well as reducing emission through investing in emission reduction projects for developing countries. Carbon credits not just solve environmental problems but earn revenue in the form of investment through carbon credit to the developing and under developed countries (Arora Vineetha, 2021).

Based on this background, this paper presents an analyze the literature on carbon credit market focusing on link between global emission, carbon footprint and carbon credit market and its overall influence on environment as well the economy.

WHAT IS THE LINK BETWEEN GLOBAL EMISSION, CARBON CREDIT MARKET AND THE ECONOMY?

As we all know global climate change is not environment as well as economy supporting scenario. Climate change, emission, environment and the economy have influence over each other. If one changes it changes the functioning of the other either positively or negatively. As the country develop by increasing its production activities which improves the condition of the economy by generating employment, availability of goods and services as well increased standard living (Positive Impact). On the other hand increased productive activities in the economy leads to utilization of resources and the process production emits carbon and its equivalent to the environment which leads to pollution and increase in earth's temperature (

Negative Impact). Carbon Credit markets works on both the impact by promoting production activity with the reduction of emission. Through this there will be sustainability in both environment and the economy. The review of studies explains the link between climate change, carbon footprint, carbon credit market and the economy has been presented below.

A. Global Emission and the Economy

Simon Kuznet (1955) explained the poorest and richest countries of the world have clean environment compared to middle income country which are always with more polluted due to inequality and income pattern, this pattern of pollution and inequalities represented through Environmental Kuznet Curve. Grossmann and Krueger (1995) popularized this idea by using Environmental Kuznet curve to study the relationship between GDP and pollution with empirical approach. They regresses data on pollution on GDP per capita and using characteristics of other city and country. Then they plotted those fitted values of pollution as GDP per capita. The inverse U shaped curve is first moving upward then falling. Inverse U shaped curve depicts the relationship between emission and economic growth. Brock and Taylor (2005) describes the Environmental Kuznet Curve relationship by dividing it into 3 parts as scale, composition and techniques. If economy improves the scale of economic activity increase proportionately, pollution will increases the economic growth. If growth is not proportional, but pollution may leads to rise or fall in income by change in composition of goods and services. If technique used is less pollution intensive growth that reduce pollution. Environmental Kuznet Curve includes these three compositions in relation to growth in the economy and pollution. Jiang Yi et.al (2008) also explains by empirically test Environmental Kuznet Curve (EKC) models to understand the connection between economic growth and environmental sustainability. Per capita income and per capita emission project inverse U shaped relation from the study.

Copeland Brian and Taylor M Scott (2003) in their study describes that there is believe that in closed economy only most of the results will be true regarding environmental economics, but it is false and international trade in goods creates major change in the world in many manner. Author highlights Kyoto Protocol on the view point of trade theory by suggesting trade will be successful in open trading world rather than closed economic setting. It stresses that activities of emission reduction in rich countries can enforce the reduction of emission by poor countries. If

world emission permits trade it may lead to worse off condition for both the countries and increase global emission. Presence of international trade with emission reduction considerations will change the several standard and outputs in environmental economics. Copeland and Taylor (2004) presented a theoretical model which is variation on the Hacksher-Ohlin model of trade with two countries, two goods and two homogeneous factors of pollution. The main twist included on the model is that production of good X which is capital intensive good, result in production of pollution. Production of 1 unit of X leads to production of 1 unit of pollution, but production of 1 unit of Y which is labor intensive which does not pollute. The model considered pollution as pure public bad, while it does not affect firm, it decreases the utility of the consumer. Global pollution is not considered in this model. It opined that the government tries to decrease the pollution by imposing tax on emission in this model. Government should put price to pollution so that the reduced utility of consumer compensated through tax.

Hertwich edgar G and Peter Glen P (2009) included 73 countries and 14 global aggregate region to calculate GHG emission. Consumption of goods and services, construction, food, shelter, cloths, mobility, manufactured goods, and trade are the eight areas chose contribution was examined. They used Multi-regional Input-output Analysis based on Global Trade Project (GTP) data base for the reference year 2001. They found that annual CO_2 emission per person range from 1 t CO_2^e in African Nations to 30 t CO_2^e Luxenberg and US. Globally home consumption accounts for 72%, government consumption for 10% and investment for 18% of GHG emission. It points out that in developing nation's food and services more crucial whereas in wealthy nations mobility and manufactured commodity are rise quickly with affluences and take over. Singhal Neerah et.al. (2008) states direct correlation between economic growth and GHG emission in the present economic condition. World have risk of losing 5% of global GDP each year as a cost of climate change. If the action is taken to reduce emission then the loss may reduced to 1% of GDP.

B. Carbon footprint

Thomas Weidmann and Jan Minx (2008) defines the carbon footprint in their article as a total amount of carbon dioxide emission that is directly or indirectly caused by an activity or is accumulated over a life stages of a product. It involves activities of individual, population,

government, companies, organizations, processes and industrial sector etc,. They use Process Analysis (bottom-up approach) or Environmental Input Output (top-down approach) methods to calculate carbon footprint. Combination of the two approaches is called Hybrid approach. The article mentioned that it is important to avoid double counting while calculating carbon footprint, because it has greater influence on carbon trading and carbon offsetting. Matthew H Scott et.al. (2008) states that many organizations are purchasing the carbon emission inventory projects to for the projection of their carbon reduction activities. These protocol definitions from carbon registries help organizations to analyze their carbon footprint.

Pandey Divya, Pandey jai Shankar and Agarwal Madhoolika (2010) specifies there is lack of specific, definition and calculations available regarding carbon footprint because there are there is no uniformity or single opinion on selection of gases and order of emission to be include in carbon footprint calculation. They also insist for standardized calculation which is acceptable to international level because carbon footprint can be considered to be the tool guide emission cuts and verifications. The article classified emission as direct and embedded emission based on various reviews. It also throws light on carbon footprint per capita of some entities and tiers based on degree of development by considering the data from UNDP 2007 which reveals that high income countries leave high carbon footprints and it is substantially low in developing countries and very less in low income countries. The study informs that majority of the organizations worldwide accepts Life Cycle Assessment using GHGs which considered the emission from raw material to packaging, distribution, consumption and as final disposal. For assessment the emission divided into tire 1-direct emission, tire 2-embedded emission and tire 3-all indirect emission. Since carbon footprint is now linked with financial transactions and it is bound to influence the business it is very much needed to develop lawful guidelines to monitor calculations and carbon footprint can be considered as a tool to reduce GHG emission which impact on climate, business as well as society. Gao Tao et.al (2014) focuses on the procedures and methods used to conduct various carbon footprint kinds. Additionally they have compared several carbon footprint assessment standards to find out their similarities, variances and flaws. It looked at the objectives, guiding principles, area of enquiry, calculation techniques, data choice and additional elements of the carbon footprint of organization and products respectively. Comparative analysis done between standards for measuring the organizations carbon footprint

It stresses that most important aspects of these assessment is choice of GHG, system setting, quantification of carbon footprint and data selection and how we treat particular emission. The guidelines of existing assessment standard need further improvisation for clear and accurate calculation .

Saidi Kais and Hammami Sami (2014) uses dynamic panel data model using Generalized Method of Moments (GMM) for the period 1990-2012 to understand the effect of economic growth and CO_2 emission on energy consumption that included 58 countries of the world. They estimated link between regional panels such as Sub Saharan, North Africa and Middle Eastern; Latin America and Caribbean and Europe and North Asia. The actual data reveals significant benefit for 4 global panels, the impact of CO2 emission on energy consumption. Economic expansions have favorable effect only if the four panels are statistically significant in terms of energy use. Kobayakawa Toru (2021) in his study explains that capital investment is considered as one of the tool for economic activity which leads economic growth but on the other hand it is accused for leading to resource depletion and environmental degradation especially through carbon emission. The article clarifies how capital formation affect carbon footprint level in developing countries and suggested ways to decrease carbon emission. The study focuses on how carbon footprint from capital formation in development activities by using multi region input output analysis model with focus on gross fixed capital formation (GFCF). It states that developing countries use more of carbon intensive capital for faster economic growth but they should reduce their carbon footprint by improving energy efficiencies. Low developing countries need to be given with more space for their carbon footprint so that they can invest for future capital formation and economic growth can be promoted. It shows that countries with high GDP per capita have less carbon intensive investment and vice-versa.

Osadume Richard and University O Edih (2021) determine how certain West African Nations fared between 1980-2019 in terms of economic growth and carbon emission. The essential theoretical ground work is provided by Simons Steinmann's economic growth model used as a base for this study. The focuseson economic expansion that have have impact on carbon emission. They use Panel Econometric method of statistical analysis by selecting six West African countries as its sample and it used secondary data from World Bank Group's

online data base covering the year 1980-2019. By using unit root test, panel regression, descriptive statistics, Granger Causality test and cointegration, it was found that economic expansion had considerable impact on carbon emission with 1% rise in GDP leads to 3.11% unit increase in carbon emission. Onofrei et.al. (2022) examines the dynamics of the link between economic development and CO_2 emission in the 27 EU member states from 2000-2017. They employ both quantitative method such as Dynamic Ordinary Least Square (DOLS), unit root test and cointegration techniques as well as qualitative sequential methodology that includes empirical analysis to give coherence and viability for the study. The result indicate that economic development and CO_2 emission have long term cointegrating relation and DOLS method shows that the economic development has a statistically significant impact on CO_2 emission for both version of estimators showing that on average , 1% change in the GDP rises in 0.0072% change in CO_2 emission. It shows that as income level rise, so does the need for environmental protection, underscoring the necessity of development environmental regulations that can cut emission.

Mac Donald and Spray John (2023) states that India is aiming to increase its energy access, affordability and security while turning towards high production of renewable energy. It is now considered as one of the major economies of the world and it is growing very fast which would significantly increase energy demand. Therefore whether it uses fossil fuel to fulfill those needs or eco-friendly substitutes that has capacity to change course of its GHGs emission for many more year. India made great stride towards achieving its target of reduction in emission under Paris Agreement but under the country's existing policies total GHGs emission will rise by 40% by 2030. According to their study developmental activities to curb poverty leads to emission but it can be reduced by advancement of technology over the years.

C. Carbon credit and the economy

Gupta Yuvika (2011) points out that global warming is currently expensive and it is needed to be curbed to protect the environment. As a result carbon market has been established at global level that allow for the trading of carbon credits. It describes how Kyoto Protocol promotes the system of carbon trading to impose restriction on GHG emission. Additionally, in the context of India, this study explores potential opportunities in the global emission market. Das Santanu

(2019) describing that by assigning value to the cost of air polluting carbon credit which creates market reducing emission of GHGs. This implies that carbon is treated as one of the major component of doing business and has influence on cost, and is imparted to other inputs like labor or war material. Since there are countless options the market is unrestricted. Business who crosses their set quota limit of emission can acquire excess permits as credits, either privately or in the open market, from the entities who have excess permits that are not used yet, they have as carbon credit. It is noted that the industry is given some freedom and certainty in how it plans to take its account the fact the overall emission must below the cap even as energy consumption increases over the time. It is noted that the price of carbon credit is different in different market.

Arora Vineeta (2021) states carbon credit is one of the key participants to reduce carbon emission which causes global warming. It points out that China, India and Brazil competing to become biggest seller of the CERs. India already committed investment to generate more than 379 million CERs. CERs bring new trading opportunities. In India there are 591 such projects worth Rs.50000 crores are under way. Emission reduction has to be done by Annexure 1 countries of Kyoto Protocol. The paper focuses on emission trading by stressing need for sound accounting procedures for carbon trading activities. It stresses that there is need for global accounting standards, firm planning related to tax, easy access to multi commodity exchange market, certification and implementation of emission reduction initiatives. It highlights the price of carbon credit in voluntary market is less compared to compliance market. India is fourth largest GHG emitter, but comparatively less per capita emission in world average. It also highlights India doesn't have proper policy regarding carbon trading. Bharadwaj Manu et,al (2022) in their paper aims to investigate the carbon tariff project undertaken by accountant in condition to global warming. It focused particularly on how business in the energy industries has changed how they operate after the introduction carbon tax. This idea is applied to the trading of carbon credit between different business and the government in order to create cash. It stresses effect of carbon tax on industries; carbon tax would affect overall profit and leads to unemployment. Indian carbon credit mainly utilized by foreign buyers; as it is not considered as goods therefore it is not subject to value and tax. It explains India carbon trading participation including case studies like Jindal Steel, Powerguda, Handia Forest Delhi Metro Rail Corporation etc. It criticized the lack of uniformity and tax accounting standard are also hurdle in the process.

Jamal Ashad (2015) expresses carbon credit is now helping countries, corporations, traders and even farmers to earn income. In India coal based power generations is considered as biggest polluter and on the other hand creates biggest opportunities for emission reduction through carbon credit trading. Indian average CERs stands at 12.5 % which have to go up to 25%. Carbon trading will be used when company exceeds its emission limit; it can buy carbon credit from the companies which have excess so that the emission will be in permissible level. Vislavath Geetha and Suresh N (2017) enumerates the that process of economic growth and era of globalization leads to GHGs emission and industrialized emission which impact on global warming in industrialized society as well as region which are non culprit of emission. It focuses on status of India in carbon credit and advance more feasible method of promoting trade in carbon credits. It defines carbon credit as "tradable certificates issues to the corporations or individuals who succeeds in mitigating emission below the yardstick prescribed. It is noted that the World Forum for Clean Technology has calculated that India have ability of earning 20% of global carbon credit which currently trades only 3%.

D. Carbon credit market and capital inflow to the economy.

Jez A Areta et.al (2023) stresses in their study that the Kyoto Protocol impose restricts to meet for binding target for only industrialized countries because they are contributing for GHG emission over the centuries. It also provides means and ways to meet their emission reduction target through 3 mechanisms. Carbon market promotes to invest in climate related projects to reduce carbon emission. Carbon credit may becoming next big thing in money. One day having carbon credit may be practically required and there doesn't appear to be any reliable alternative global currency that is unaffected by regional politics. Because CO_2 has global influence, carbon credit will always the worth same amount no matter where we are. The global carbon market is increased by 37% from 2008 to 2009. In 2012, the carbon market was $408 billion and in 2020 it was 2.1 trillion. (Singhal Neeraj and Gupta Himani, 2012; Agarwal Payal and Vinod Kothari and company,2022) Jamal Ashad (2015) focuses on the 8 principles of International Council for Chemical Association (ICCA) to guide the global climate discussion Carbon credit can be considered as capital inflow to the country. Right now India has vast forest and agricultural land which open up with lot of carbon credit earning opportunities in carbon market but India will

eventually become developed country then it must adhere to the restrictions of Kyoto Protocol. Hua Guowei et.al. (2011) points out carbon emission and overall cost related to it was examined analytically and numerically by introducing an environmental inventory model under cap and trade system. It states that when the cap is low than threshold, the retailer should buy carbon credit and vice-versa. When the cap is equal the threshold, he neither buy nor sell.

Singhal Neerah et.al. (2008) noted developing nations blaming developed nations to take responsibility for global warming so that the carbon dioxide is now tradable commodity within them. Kyoto Protocol with three mechanisms enables the developed countries who have with emission reduction commitments to limit their emission by acquiring carbon credit in the world market. It points out regarding CDM projects HFC reduction accounted for half of the market and energy efficiency projects accounts 27%. They criticized carbon credit and carbon market that there will be only money exchange from one hand to another but pollution will not decrease and right to emit also shift from one to other. But it has to be proven with empirical studies before accepting it. NSWAI (2007) describes that Clean Development Mechanism (CDM) motives the nation to invest in emission reduction projects in developing countries as developing countries considered these investment is costly to invest on their own. It clarifies the functioning of international trade mechanism. It gives clear picture about the division of countries based on UNFCCC as 2 groups. It provides the opportunities for India to grab highest benefit of carbon trading which accounting 25% of total world carbon trade. Out of 391 projects sanctioned by UNFCCC 114 were registered from India and it is stand at 12.6% of average annual CER which is 11.5 million.

Mondal Atish Prasad and Sachdev Sanchith (2013) say that carbon credit market is growing very fast as a financial market sector. The Clean Development Mechanism (CDM) which permits carbon credit earning and selling between nations and business dominates these markets and established carbon credit exchange in the commercial sphere. It is crucial to assess the worldwide picture the carbon industry and its level of achievement. Since developing free from treaties legal requirements, it is anticipated that it will benefit from the protocol in terms of technology transfer and its associated foreign investment. India entered early and performed well but when China entered the market it outperformed India. Even Indian public sector involves

very less in carbon market. Bhanawat Shuveer Singh and Vardiaa Shilpa (2015) show the opportunities to generate income via implementation of structured CDM projects that has provided new source of income for the Indian corporate sector. It aims to investigate the corporate sectors revenue from carbon credit in India. Ten companies who revealed their revenue from carbon credits in their annual reports are included in the study. The sample units are chosen from varieties of economic sectors, including those that produce cement, steel, sugar, paper, electricity and chemical and power equipment. On average, just 6.84% of total revenue could be generated by sample units. It finds that there is significant difference between average amounts of revenue generates by trading carbon credits for various sample year.

Garg Ajay K and Arya Satyendra (2015) noted that Multi Commodity Exchange Market (MDX) is the first exchange in Asian to trade carbon credit. India get benefit from 25% of the total carbon credit trade. It highlights that the Municipal solid waste dumping ground will be the huge opportunity for India which is not only benefited to the government but to general public. Malav Mahesh Kumar (2015) says that companies established in developing countries earn extra benefit from carbon trading along with pollution reduction. Lot of organizations had taken monetary and non monetary benefits through carbon trading. Carbon market gives monetary value to the cost of polluting climate. It found that carbon credit trading has improved social status, market share, and reduce cost of meeting emission targets and also provides additional revenue. Capital gain contribution to the trade in carbon and revenue generated by application of carbon reduction technologies were benefit of the carbon market in India and other developing countries. (Garg Ajay K et.al. ,2017; Rajput Namita et.al,2018) Deepa R (2022) reveals that Clean Development Mechanism (CDM) projects with carbon credits potential in different regions of the globe revealed that the Asia and Pacific region stood tall in contributing to the Emission reduction projects.

Paul Ashm (2011) highlights the present condition of carbon credit trading with special focus on India and highlights future opportunities and benefits in the form of carbon credit . India and China considered as biggest seller and Europe is considered as biggest buyer of carbon credit. It stresses that whether be the industry or wherever it established, if it comes under Kyoto Protocol it has to limit its emission and if it fails to do so it has to buy carbon credit through

carbon trading. Carbon trading meet demand and supply gap in carbon credit. It points that many Indian companies started finding higher income in carbon credit than that from their nucleus business. Indian companies are taking interest in investing eco-friendly projects to earn carbon credits as carbon trading market in India is one of the fast growing financial market. The challenges faced by Indian industries are reduction in emission with economic development and accountability of the emission. Vidyapeeth Patil. (2008) found that very less sugar industries registered for carbon trading and it is due to lack of knowledge. Through carbon trading project there is opportunity to upgrade the industry through entry in carbon market which generates additional profit along profit from existing business. SSK sugar industries Solapur solely earned 1.6 crore through carbon credit in a year therefore it clear cuts the existing opportunity for Indian industries to earn through carbon market. They suggested Indian government need to finance the implementation of carbon trading opportunities for sugar and other industries for the better implementation of CDM projects.

Kumar Praveen (2011) in their essay attempted to investigate how carbon credit will become a widespread phenomenon with significant and long term strategic ramifications. It imparts that the carbon credit will soon become variable instrument opportunity and tradable community in a global scale. It can be traded between companies or bought at the ongoing market price in the international market. For developing nation like India this new security is seen as a chance to make money. By ensuring sustainable development of developing nations and asserting wealthier nations in upholding their obligations under Kyoto Protocol, Carbon Credit has significantly and creatively changed international trade. It stresses opportunities for India to create wealth through carbon market. It concludes that India greater opportunities achieve capital flow though Certified Emission Reductions and Clean Development Mechanism (CDM) of Kyoto Protocol by reducing carbon footprint. This would propel the Indian Economy to unprecedented. Gorain Subrata et.al. (2021) states that in many nations the agriculture industry contributes significant GHG emission especially burning agricultural biomass contribute more to it. It points out that around 92 million tonnes of crop waste are actually produced in India, having significant impact on both environment and public health. Two efficient methods to curb these emissions under Kyoto Protocol is carbon trading and CDM projects. They have used

econometric models like linear regression model, cointegration matrix to analyze impact of carbon trading on stock market variables.

Bharadwaj Bhavana (2013) depicts that at the moment; global warming is costing money and giving environmentalist a lot to worry about. There is now chance to utilize carbon trading by creating carbon market. Carbon trading industry has bright future because it is burning issue as it affects the world climate and developing countries have huge opportunities if it utilized the market in a good manner to reduce its emission as well as earning income. Nussbaumer Patrick (2007) noted that there is little information available about voluntary market. Voluntary market is criticized for lack of credibility. It is criticized that in some time the price paid for the carbon credit cross the actual cost that can be incurred to reduce emission. It illustrates price volatility in carbon market and reason behind fluctuations. Dubey Atul and Johri Shiva (2020) reveals that the mechanism framework of carbon trading is still being processed however each nation's goals are assigned in a very clear manner. To encourage business and society at a large, every nation strives to encourage people to reduce carbon footprint and their practice and process

CONCLUDING REMARKS

In the present world, emission is considered as hindrance for environment as well as economic growth. On the other hand emission can be converted as a commodity to earn income in the world market. There are several Carbon markets working around the world and have different functioning system. Therefore there is need to study carbon markets and comparing those markets with Indian carbon market and opportunities for improvements to attract major benefits of carbon market.

From the above reviewed literature it is noted that there is more importance given to fundamental concepts and conceptual clarification involved in carbon footprint and carbon credit mechanism. The economic growth and carbon emission have inter-relationships and they are moving together in long run (Onofrei Mihaela et.al 2022). It is noted that there are few literature regarding detailed study on comparative analysis of emission trading systems of the world especially with focusing on Indian carbon credit market. There is gap in studies related to carbon credit and

trends in foreign investment inflow. There is enormous opportunity for the developed countries to participate in carbon credit market to attract investment from developed countries who are working on their emission reduction target. Hence there is huge scope for comparative analysis of carbon foot print of various countries and carbon trading practice in the world along with investment possibilities through carbon credit and its benefits for India. The inevitable future that carbon credit holds needed to be witnessed and there is need to focus on challenges faced by India in world carbon market.

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