IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

A STUDY ON CARBON TAX AND CAP-AND-TRADE AS A CARBON EMISSION REDUCTION INSTRUMENTS IN INDIA

1Dibyansh Rai, 2Dharmendra Singh

1Research Scholar, 2Research Scholar

1Deen Dayal Upadhyaya Gorakhpur University, Gorakhpur-273009,

2Deen Dayal Upadhyaya Gorakhpur University, Gorakhpur-273009

ABSTRACT

The Greenhouse gases (GHGs) emission around the world is increasing rapidly, giving rise to global warming, which in turn is leading to uncertain and adverse weather and climate conditions, the cost of which is both financial and social. Being the 3rd largest GHGs emitter of the world, India is suffering from the ill effects of the emission in all the sphere whether it is financial, social, physical, or environmental. Rising global temperature and adverse environmental conditions have given rise to innovation and research in the field of financial environmental protection instruments such as carbon tax and cap-and-trade, both of these policy instruments have their own pros and cons and their success depends upon the countries regulatory and policy framework, that is why where one of these policy instrument work other doesn't and sometimes the hybrid of these two is used. Accounting of such instruments is the need of the hour, as it will imbibe the cost and benefit of such instruments towards emission control and it will give more transparent picture of the entity to rely on. The comparative trend of the carbon tax paid over the years, disclosure of carbon credits used and available will give substantial information to the stakeholders. In the light of the above, this paper focuses on the accounting of impact of these two instruments on emission reduction in India, in the existing financial and physical Infrastructure. The objective of this paper is to provide the stakeholders with information about the significant impact of these policy instruments and what changes in these and in the infrastructure can be made to increase their scope and benefit. The research is based on secondary data and it is descriptive in nature, the duration of research is 2 years from 2018 to 2020, the sampling unit, are the companies paying carbon tax and using carbon credits. The analysis concludes that, there is significant impact of both instruments on emission reduction.

KEYWORDS: GHGs, Carbon tax, Cap-and-trade

I INTRODUCTION

AN OVERVIEW OF CARBON TAX AND CAP-AND-TRADE

A dangerously warming planet is not just an environmental disaster. Fundamentally, it is an economic and social challenge. Putting a value or price on carbon emissions tackles climate change at its source. This creates an incentive for firms and individuals to change their investment, production, and consumption patterns. Through a clear and strong price signal, carbon pricing sets the right incentives for the much-needed large-scale transition to a low-carbon economy.

A carbon tax is a fee imposed on the burning of carbon-based fuels (coal, oil, gas). More to the point: **a carbon tax is the core policy for reducing and eventually eliminating the use of fossil fuels whose combustion is destabilizing and destroying our climate**. A carbon tax provides certainty about the prices of emission as it is regulated by the government. It creates a pool of funds with the government which can be used to undertake renewable energy projects and other sustainable activities. It is priced per tonne of carbon emitted.

Under a cap-and-trade system, a government sets a cap — a limit — on the amount of greenhouse gas emissions various industries can emit into the atmosphere. This limit is gradually reduced over time to decrease total pollution levels.

Governments can distribute free carbon emission credits, auction them off or sell them to industries within the overall limit. Companies that need additional credits can then purchase them from other companies that do not need their full emissions allowance.

The goal of the system is to encourage industries to reduce their carbon footprint by effectively putting a price on pollution. **The price of the carbon credit is determined by the market demand and supply forces , they don't have much certainty about the prices but are more certain about emission reduction as compared to carbon tax , this also provides a ready platform for sale and purchase of surplus credits to keep the overall emission in limit. A carbon credit is equal to one tonne of carbon emission reduced.**

WHY THIS STUDY IS IMPORTANT

India has always been a big supporter of environment and climate protection programs, as it is aware of the rising global temperature and depletion of the ozone layer causing global warming. The efforts that India made in this direction can be seen in the commitment made by it in the Kyoto protocol, Paris agreement, Sustainable development goal agenda of 2030 and the recent solar alliance. The need of this study for India can be deduced from the below-

India has committed to reduce the emissions intensity of its GDP by 20 to 25% by 2020.

In accordance with the COP21 Paris accords, the Government of India has set a target of adding 175 GW of renewable power in the country by 2022.

India also made a commitment to play its part for limiting the warming over the 21 century to below 2 ºC relative to pre-industrial levels.

From the latest WHO report, from the top 15 most polluted cities in the world 14 are from India.

Total damage to India because of environmental degradation is US $ 80 billion, says first such national-level economic evaluation made by World Bank.

Thus carbon tax and cap-and-trade have a significant role to play for achieving the targets and tackling the challenges stated above, as on one hand carbon tax provides certainty of prices of emission and will make the carbon based fuel and products costly which in turn will force people to move towards renewable projects and products, and on the other hand cap-and trade will provide a market mechanism based trading platform to reduce carbon emission and use the balance as credit to trade with the other companies who want to exceed their limit to earn profit. India has a great scope for implementation of these approaches in their true sense in order to achieve the above goal and reduce dependency on carbon based fuels, although these policy instruments have started playing their role in the country but to get an insight of their true value in Indian scenario this study will be crucial. Carbon emission have a social cost, with the pricing of it the proceeds will be used for reducing the cost and maximising the social benefit. This study will help to find out which instrument will play a better role in Indian scenario with the existing infrastructure and also with the modification or we need a hybrid of these two instruments to serve the above and other purpose.

CURRENT EXISTENCE OF CAP-AND-TRADE AND CARBON TAX AROUND THE WORLD

National and regional jurisdictions where carbon tax or cap-and-trade is implemented-

Carbon tax		**Cap-and-trade**	
Finland	Portugal	EU	Switzerland
Denmark	Norway	New Zealand	Kazakhstan
Switzerland	Estonia	Korea	Australia
Ukraine	Iceland		
Mexico	U.K		
Poland	Chile		
Slovenia	Sweden		
Liechtenstein	Latvia		
Japan	Ireland		
France	Colombia		

In Switzerland both carbon tax and cap-and-trade is implemented

Apart from the above there are various other national, regional and subnational jurisdictions also where carbon tax or cap-and-trade is either fully implemented or implemented as a pilot project, also there are some projects which are about to schedule or is under consideration.

Carbon tax although controversial in USA but in British Columbia it is so successful that 100 businesses said they are in support of a tax increase. The success of carbon tax can also be seen in Sweden which puts it on top of the green list.

Cap-and-trade is a newer concept but it is not far from success the role it had played can easily be seen in EU and New Zealand.

India can use any of the two or both of these policy instruments to write its own success story based on its existing infrastructure and with modification.

FUTURE PROSPECTS OF CAP-AND-TRADE AND CARBON TAX IN INDIA

Since July 1, 2010 India is using carbon tax of 50 rupees per tonne which in 2014 increased to 100 rupees per tonne of coal both produced or imported in order to make it costly and to reduce dependency on it, India is considering carbon tax on other carbon based fuels to have a greater impact on emission reduction, India is also considering carbon tax as a step towards the voluntary target to reduce the amount of carbon dioxide released per unit of gross domestic product by 25% from 2005 levels by 2020, and to play its part to keep the rise in global average temperature below 2 degree to pre-Industrial level.

Cap-and-trade is also playing its role in India as various Indian companies are participating in it under the clean development mechanism (CDM), and now India have two commodity exchanges for trading in carbon credits thus providing a better trading platform and price. India is looking for technology transfer and investments from abroad to reduce emission and trade the credits to earn profit, which will open new avenues for trade and emission reduction to achieve its target.

Implementing one of these approaches or both based on their pros and cons and infrastructure would lead to shift towards renewable energy projects and products as they will be more price competitive, and also due to less emission the health issues associated with it will also reduce which in turn will reduce governments burden to allocate funds to subsidize those healthcare facilities.

India is dependent upon carbon based fuels for its production, transportation, and household activities, after the implementation of the above instruments the fuel will become costly and also the product made with the help of these fuels, which will compel people (corporates, households and others) to shift towards clean energy and green products which will not only reduce emission but will also reduce dependency on carbon based fuels thus minimising currency flow to abroad.

From the above it is clear that the future of these policy instruments and their accounting will be very bright and successful.

II LITERATURE REVIEW

A research article entitled "Carbon taxes vs. Cap-and-trade: A Critical Review" by Lawrence H. Goulder and Andrew R. Schein (2013)

In this article, the authors have taken into stock the relative attractions and disadvantages of Carbon tax, Cap-and-trade and their hybrid, also they have reviewed and interpreted previous findings and offered some new insights. They concluded that all the three approaches carbon tax, cap and trade and the hybrid have the potential to bring about greenhouse gas emission reduction in a way that is cost-effective and equitable as well as environmentally successful.

A paper entitled "Cars, Carbon taxes and CO_2 Emissions" by Julius j. Andersson (2017)

This paper is focused on the empirical analyses of the question whether carbon tax is effective in reducing greenhouse gas emission (with reference to Sweden), and thereby mitigating climate change. The paper concluded that carbon tax can be successful in significantly reducing emissions of CO_2.

A paper entitled "Economic Growth and Climate Change: Cap-and-Trade or Emission Tax?" by Edward Nell, Willi Semmler and Armon Rezai (2009)

In this paper, the authors have made a historical investigation into the theories of economic externalities of Pigou and Coase, they have also made a discussion on some empirical facts regarding relationship, causes and consequences of global warming, in the light of the above mentioned theories they have analysed which of the policy instruments are preferable. They came up with a conclusion that taxes are to be preferred over the cap-and trade system as the latter is subject to many drawbacks.

A research article entitled "A Meaningful U.S. Cap-and-trade system to address Climate Change" by Robert N. Stavins (2008)

In this article, the author has proposed and analysed a scientifically sound, economically rational and politically feasible approach for the United States to reduce its contributions to the increase in atmospheric concentrations of greenhouse gases. He came up with a conclusion that cap-and-trade is the best approach for the United States in the short to medium term, besides providing greater certainty about emission levels it is straightforward to harmonize with other countries' climate policy.

A research paper entitled "The design of a carbon tax" by Gilbert E. Metcalf and David Weisbach (2009)

This paper focused on the design of a tax on greenhouse gas emissions for United States. They considered three major issues: the tax rate, the optimal tax base and international trade concerns, they show that a well-implemented carbon tax imposed upstream can easily cover 80% of the U.S. emissions and can likely cover almost 90% with modest additional cost. The benefits of the broad base and lower compliance costs are likely to be significant.

A research paper entitled "Carbon trading: unethical, unjust and ineffective?" by Simon Caney and Cameron Hepburn (2011)

In this research paper, the authors have made a study to check the objection raised against cap-and-trade on three grounds – ethics, justice and effectiveness through the lens of moral philosophy and economics. They concluded that only the objections based on distributional justice can be sustained, their analysis also shows that cap-and-trade are more effective at reducing emissions than many of their critics appear to believe and cap-and-trade is better than carbon tax in many ways, although carbon tax have some advantage over cap-and-trade.

A research paper entitled "Carbon tax vs. Cap-and-trade: Implications on developing countries emissions" by Gabrial Anandarajah, Fabian Kesicki and Steve Pye (2014)

In this paper, the authors have worked on to investigate the roles of carbon tax and cap-and-trade policies to mitigate global carbon dioxide emission, particularly focussing on reduction from developing countries. They concluded that both carbon tax and cap-and-trade policies result in emission reduction in developing countries. Under a cap-and-trade policy, when only developed countries are constrained to 80% in 2050 and 90% in 2100, a considerable amount of developing countries' emissions are reduced as it is cheaper to abate emissions in developing compared to developed countries.

A research paper entitled "Causality among energy consumption, CO2 emission, Economic growth and trade: A case of India" by Srinivasan P (2014)

In this the author investigates the causal nexus between energy consumption, CO2 emissions, economic growth and trade in India using some tests and models. He came to a conclusion that, there is long-term relationship between energy consumption, CO2 emission, economic growth and trade in India, his research also states that energy use influences CO2 emission and trade in the short-run, suggesting energy consumption plays a significant role towards foreign trade, however more energy use in the country can lead to environmental degradation and pollution in the country. And one-way short-run causation exists from CO2 emissions to GDP in India.

A research paper entitled "Carbon credit: A step towards green environment" by Ms Yuvika Gupta (2011)

In this paper, the author discussed the basic concepts and importance of carbon credit. This paper also emphasized on the methods used to save environment and discussed the business opportunities in the global emissions market in Indian context. In this paper, the author concluded that India is an emerging leader for the developing countries in designing innovative strategies and portfolios for carbon trading.

A Policy report entitled "How to make carbon taxes more acceptable" by Stefano Carattini, Maria Carvalho and Sam Fankhauser (2017)

In this report, the authors have explored practical ways through which carbon taxes can be made more politically attractive. It reviews the empirical evidence on people's attitudes towards environmental taxes and draws lessons from these findings on publicly acceptable forms of carbon taxation. This report concludes that making carbon taxation more acceptable to the public is important because carbon taxes are one of the most effective ways of incentivising the reduction of greenhouse gas emissions. By putting a price on carbon, emitters are confronted with the environmental cost of their actions, and forced to manage their carbon output, putting a price on carbon is an essential aspect of cost-effective emissions reduction.

A report entitled "A Carbon Tax in broader U.S. Fiscal Reform: Design and Distributional Issues" by Adele C. Morris and Aparna Mathur (2014)

This report by Adele Morris and Aparna Mathur, economists with the Brookings Institution and the American Enterprise Institute respectively, examined the issues and options for designing one type of carbon pricing mechanism—a carbon tax. They came up with the conclusion that a carbon tax could, if designed correctly, improve the long-run U.S. fiscal situation while controlling U.S. greenhouse gas (GHG) emissions. If the United States uses revenue from a carbon tax to fund a long-term reduction in other taxes, the tax swap could potentially enhance the overall economic efficiency of the tax code.

A research paper entitled "Equity and Efficiency in Cap-and-Trade: Effectively Managing the Emissions Allowance Supply" by Adele C. Morris (2009)

This paper considered the distributional effects of cap-and-trade across different sets of people, including consumers, shareholders, household income groups, and geographic regions, and it explores the role of policy design in determining those effects. The paper concludes that serious a cap-and-trade system necessarily transfers wealth from those who bear higher energy and other prices to those who receive those prices and the value of allowances.

III OBJECTIVES OF THE STUDY

The objectives of the study are as follows-

1-To study the impact of carbon tax on emission reduction in India.

2-To study the impact of cap-and-trade on emission reduction in India.

3-To see which of these two policy instruments will perform better in the existing financial and physical infrastructure**.**

IV RESEARCH METHODOLOGY

Nature of data

The study is based on secondary data.

Collecting secondary data

Secondary data has been collected from various research journals, magazines, case studies, websites, bulletins, newspapers, circulars , clippings, and from reports of various environmental and government institutions such as NGT, CTC, ministry of environment Protection, Corporate social responsibility data of some companies has also been assessed to get a deeper insight for the purpose. International best practices in this direction has also been studied to serve the purpose.

Nature and period of study

The nature of study is descriptive and the period of study is from 2018 to 2020

QUANTITATIVE AND QUALITATIVE ANALYSIS TECHNIQUES

The collected data has been scrutinized and edited. Proper presentation has been made by drawing simple and two way tables, simple table has been used to analyse the general information of the sample where as two way tables is used for comparative analysis. Pie chart and bar chart has also been used wherever required, for the qualitative analysis part SWOT analysis and EIA analysis has been used. Hypothesis is tested with the help of karl pearson's correlation coefficient using Excel and SPSS software.

V ANALYSIS

The study shows that both carbon tax and cap-and-trade are significant in carbon emission reduction , accounting for such instruments would not only disclose the social and environmental cost but will also provide more transparency on operations on which the stakeholders can rely and take their respective decisions. The Study showed that some selected list of companies paying carbon tax and using carbon credits were able to reduce their emission over the years and they are laying the foundation stone of companies yet to undertake such measures, but at the same time it has raised concern over no proper disclosures of such taxes and credits having no proper standard of disclosure. Only few big companies are moving in this direction and it is yet to develop in its true sense and get fully implemented in India but once done will improve investors trust in companies and at the same time protect environment.

The analysis showed that both the carbon tax and cap-and-trade instruments have significant impact on emission reduction.

VI CONCLUSION

In India carbon tax and cap-and-trade policy instruments have yet to develop in its true sense, only few companies in India are paying carbon tax in one way or the other, carbon credit has no active market in India and there is no substantial benefit in selling the credits as the price is very low because of the low demand, the auction system of credits is also underdeveloped, although there is marketability of such credits on stock exchanges but they are not liquid and active. In India these instruments have not been made mandatory, they are still at their developing stage. The companies paying carbon taxes and using credits for emission reduction, have shown positive response over the years by reducing their carbon emission substantially to avoid such charges.

VII REFERENCES

Arrow, K. (2007). "Global Climate Change: A Challenge to Policy," The Economists' Voice. http://dx.doi.org/10.2202/1553-3832.1270.

Cooper, R. (2004). "A Global Carbon Tax?" Council on Foreign Relations, Commissioned Briefing Notes for the CIGI/CFGS L20 Project

Dion, S. and E. Laurent (2012). "From Rio to Rio: A Global Carbon Price Signal to Escape the Great climate Inconsistency," Working papers OFCE, 2012-16, May.

Akpan, E.G., Akpan, F.U.: Electricity consumption, carbon emissions and economic growth in Nigeria. Int. J. Energy Econ. Policy 4, 292–306 (2012)

http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2017/12/How-to-make-carbon-taxes-more-acceptable.pdf

https://www.carbontax.org/

https://data.worldbank.org/indicator/EN.ATM.CO2E.PC

http://wgbis.ces.iisc.ernet.in/energy/paper/carbon-footprint/Results.html

http://www.indianresearchjournals.com/pdf/APJMMR/2013/August/6.pdf

www.indiaenvironmentportal.org.in/category/1910/thesaurus/carbon-tax