

Efficacy Of Implementation Of Carbon Tax In India

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Abstract

The carbon tax is an essential tool for reducing GHG emissions and reducing the impact of climate change on society and the environment. It is considered an effective way for generating revenues that can aid the sustainable development of the nation. India is one of the top carbon emitters of the world and thus has a significant role to play in reducing emissions and fighting climate change. In regards to that, India has implemented various policies and measures to meet its global commitments and reduce emissions. Coal Cess is one of the key policies implemented by the country which is often referred to as carbon tax and involves paying a tax of Rs 400/ton of coal in the present scenario. However, the coal cess is just an implicit carbon tax policy that has been ineffective in reducing the GHG emissions of the country. The carbon emissions of the country have only increased over the years and this has put the country in the position to implement an explicit carbon tax policy based on international standards to reduce its emissions. Hence, the purpose of this paper has been to analyse the efficacy of the current implicit carbon tax policy while evaluating the effectiveness of an explicit carbon tax policy for the nation. The entire analysis has been done with the help of secondary sources of information. It has been found that the current implicit tax on carbon has been ineffective in reducing carbon emissions and thus the country needs to implement an explicit tax on carbon for reducing its emissions.

Keywords: carbon tax, GHGs, CO₂, economy, implementation, efficacy

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I. Introduction

Climate change and global warming are the biggest challenges for people and governments across the globe in the 21st century. The concentration of greenhouse gases (GHGs), especially carbon dioxide (CO₂) has risen rapidly over the years and this has led to an increase in global temperatures. All of these have further contributed to rising sea levels and extreme weather conditions which in turn have had devastating impact on urban settlements and ecosystems. As leaders across the globe prepare to stop the climate change catastrophe, carbon tax implementation has emerged as a viable solution to reduce the emissions of CHGs and further funding the strategies for mitigating the impact of climate change (Geroe, 2019). The carbon tax is a fee levied on the production, distribution and consumption of carbon-intensive fuels like coal, gas and oil. The purpose of this tax is to discourage the use of these fuels and make the necessary shift towards renewable energy (Metcalf, 2019). The fee for this set is based on the carbon content of the fuel and thus fuels producing high CO₂ would have to pay a higher fee as carbon tax. The amount collected as part of the carbon tax can further be used to fund green strategies like renewable energy projects, energy-efficient public transport and research & development. Hence, reducing GHG emissions is the need of the hour and levying a carbon tax to limit the emissions could play a significant role in the process.

Carbon taxes and other implicit carbon pricing mechanisms are being used as an instrument by governments across the globe to enforce a price on carbon. The carbon tax has been explicitly implemented by a few countries in the world to reduce emissions while a total of 46 countries have implicit policies regarding carbon pricing (IMF, 2022). India is not one of the 27 countries to have an explicit carbon pricing policy like carbon tax but it has various schemes and taxation mechanisms that put a price on carbon and are referred to as carbon taxes in the nation. Coal Cess, Renewable energy certificates, National Action Plan on Climate Change, National Solar Mission, Clean Energy Fund and Perform Achieve Trade schemes are some of the implicit carbon taxes implemented by the Indian Government to put a price on carbon (Meena *et al.* 2021). India is the third largest emitter of CO₂ after China and the US and the emissions of the country are only going to rise in the future with growing demand for transportation and electricity. Hence, the contribution and efforts of India have a significant role to play in the fight to reduce global emissions. The implementation of an explicit carbon tax in India can have a significant impact on reducing emissions and there are numerous arguments in favour of carbon tax in the country. However, there are also arguments that are against the implementation of explicit tax considering the impact that it can have on the growing Indian economy. Hence, the purpose of this article is to discuss the efficacy of implementing a carbon tax in India by looking at all the implicit and explicit perspectives on the subject.

II. Materials and methods

The growing concern at the global level about rising emission levels and deteriorating environmental conditions has led to various reports being published and research being carried out to create the necessary awareness. With India being one of the key players in fighting climate change, numerous data and reports are available online discussing the implementation of a carbon tax in the region. Hence, the method that has been used in the article to discuss the efficacy of the implementation of a carbon tax in India is secondary. The secondary method involves gathering data and information published by others to conduct an analysis. Hence, government reports, peer-reviewed articles and online materials provided by top institutions in India and the world have been used to complete the required research. There is a vast amount of information that is available online which is able to provide a complete insight into carbon taxation in India and thus all of these secondary sources had been referred to and included in the study as per its requirements.

Further, the next step in the process involved looking for appropriate codes and patterns within the data to present the discussion in a structured manner. After the patterns and codes within the data were identified effectively, then the next step involved developing appropriate headings to present the findings in an appropriate manner. The next section of the article would present the findings under different headings and complete the analysis accordingly in order to gain the required insights. Hence, the entire research has been completed with the help of secondary sources that were accessible online and contained proper evidence about carbon tax in India.

III. Findings and analysis

Efficacy of Implicit Carbon Taxation in India

Coal Cess which was introduced in 2010 is often seen as an equivalent to a carbon tax in India and this is mainly because of the reason behind its introduction. The primary goal of the coal cess was financing and promoting clean energy initiatives while funding research on clean energy through its transfer to the National Clean Environment and Energy Fund (NCEEF). In 2010, Coal Cess imposed a tax of Rs 50/ton of coal produced and imported in India and now that amount has risen to Rs 400/ton (Malik *et al.* 2020). Apart from this, several efforts have been made by the government at the state level to reduce the emissions like the Green Cess in Goa and Eco Tax on automobiles coming to Mussoorie. The tax levied by the government of India on coal is almost one-fifth of the cost involved with the mining of coal in the country. However, all of these were done to increase the consumption of cleaner energy in the country. Apart from that, there were various other implicit carbon taxation policies that were launched by the government to reduce emissions and address the impact on the environment. Perform Achieve & Trade (PAT) schemes and Renewable energy certificates (REC) are two such carbon pricing mechanisms introduced by the Government to reduce GHG emissions (Tyagi *et al.* 2018).

PAT is a regulatory instrument designed for the reduction of Specific Energy Consumption (SEC) in energy-intensive industries with the help of certification for excess energy saving that can be traded (Bureau of Energy Efficiency, 2023). PAT was designed by the Bureau of Energy Efficiency (BEE) for improving the energy efficiency of high energy-intensive industries that were identified as Designated Consumers (DCs). PAT was involved in developing the methodology for SEC norms for DCs, devising the verification process for SECs and looking for ways to issue Savings Certificates (Bureau of Energy Efficiency, 2023). PAT mechanism was created under the provisions outlined in the Energy Conservation Act, of 2010 empowering the Central Government to term energy-intensive industries as DCs. In context to the PAT scheme, BEE has set targets for DCs based on sector-specific studies highlighting the high energy-saving potential of various industries. The first cycle of PAT was completed in 2015 with sectors resulting in an energy saving of 8.67MTOE and this translates to the avoidance of 31 million tonnes of CO₂ emissions (Bureau of Energy Efficiency, 2023).

Sector	Number of DC	Energy savings Achieved (Mtoe)	CO ₂ Emissions (Mn tonne of CO ₂ /year)
Aluminium	10	0.73	3.10
Cement	85	1.48	4.34
Chlor-Alkali	22	0.09	0.62
Fertilizer	29	0.78	0.93
Iron & Steel	67	2.10	6.51
Pulp & Paper	31	0.29	1.24
Textile	90	0.13	0.62
Thermal Power Plant	144	3.06	13.64
Total	478	8.67	31.00

Figure 1: Summary of energy saving and emission reduction PAT Cycle I

(Source: Bureau of Energy Efficiency, 2023)

Similarly, Renewable energy certificates (REC) were introduced by the Central Electricity Regulatory Commission (CERC) to increase the adoption of renewable energy sources by state utilities. REC is a market-based instrument which means that the owner of the REC certificate has 1 MWh of electricity that has been generated from renewable sources (Indian Energy Exchange, 2023). REC can also be referred to as a tracking or accounting tool for the use of renewable energy in the country. Hence, Coal Cess, PAT and REC are the implicit carbon tax implemented by the country but there have been various issues highlighted with these pricing mechanisms. In the case of the coal cess, the funds were not utilised in an efficient manner while with PAT and REC, the targets were found to be lenient with the absence of penalties for non-compliance with targets. All of these implicit carbon taxes implemented by the government of the country have been unable to reduce the GHGs emission in the country. GHGs emission in India was more than 3 billion metric tonnes in 2020 with the electricity and heat sector producing the most with 1.2 billion metric tonnes (Tiseo, 2023). The emissions in the agricultural sector which was once the biggest emitter of GHG have increased 30% over the last three decades while the emissions from the electricity and heat sectors have increased fivefold over the past three decades (Tiseo, 2023). Hence, it is also appropriate to say that the carbon pricing mechanism in India or the implicit carbon tax have been inefficient in reducing GHGs emission. It is only high time that the nation thinks about an explicit carbon tax to reduce GHGs emissions in response to climate change.

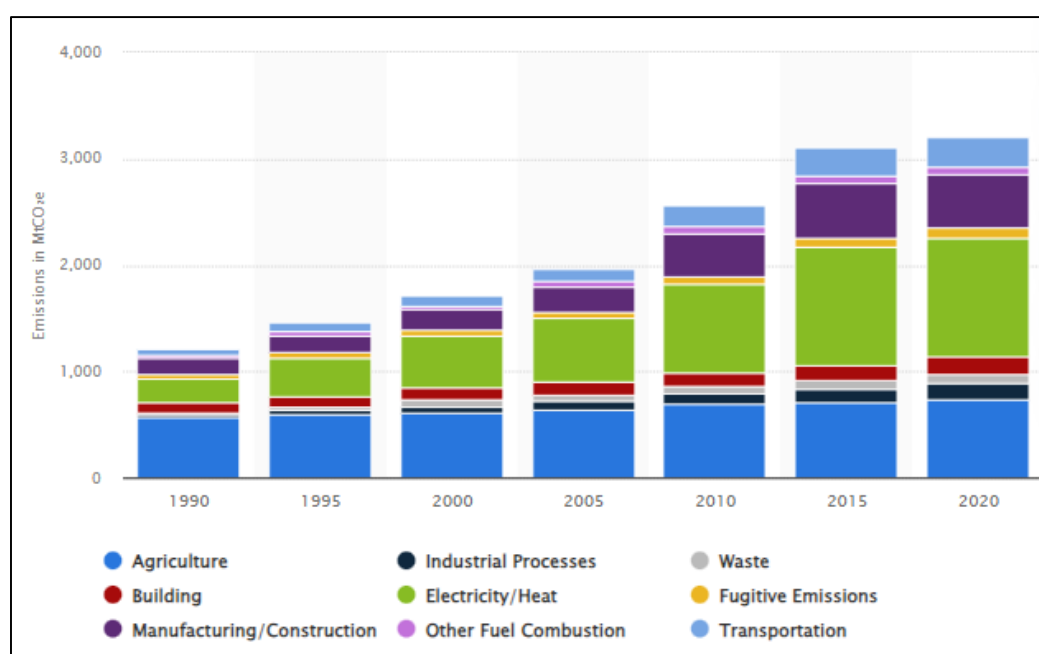


Figure 2: GHG emissions in India 1990-2020, by sector
(Source: Tiseo, 2023)

An Indian Perspective on Explicit Carbon Tax

Climate change is one of the biggest challenges for leaders and institutions across the globe which calls for an integrated response to this particular issue. India is one of the key nations that has been impacted by climate change and as a developing nation, it is of paramount importance for the nation to reduce carbon emissions. India is also a key member of the United Nations Framework Convention on Climate Change (UNFCCC) whose primary aim is the reduction of the GHG emissions in the atmosphere (Hickmann *et al.* 2021). India has ratified various agreements at the global level to reduce the impact of climate and the Paris Agreement is one prime example in this context, which is a legally binding global treaty related to climate change. The Paris Agreement has various goals and one of the biggest goals of the agreement involves achieving carbon neutrality by 2050. Hence, with the ratification of the Paris Agreement, India has taken the pledge to reduce its emissions towards the path of carbon neutrality by increasing the availability of cleaner energy and increasing the funding in the process (Ravindranath *et al.* 2017). Prime Minister Narendra Modi mentioned that the country is on track to meet the set climate goals way before the target date since it is aggressively investing in clean and renewable energy. India has taken numerous steps towards meeting its international commitments over the last few decades and some of the key steps in this direction have been discussed in the previous section. However, despite the steps taken by the nation, India continues to be the largest emitter of CO₂ after China and the US.

None of the measures taken by the Government of the country have been effective in addressing the climate change issue while reducing the emissions in an effective manner. The implicit carbon tax that has been

introduced by the government has failed to provide the required results and contribute towards lower emissions (Ojha *et al.* 2020). Hence, it only begs the question of whether the nation should consider an explicit 'carbon tax' to reduce emissions and mitigate climate change. On the other hand, the implementation of the carbon tax in various countries across the globe also makes it a decisive factor for the nation. The implementation of the carbon tax by various countries has various implications for trade and exports in the nation. The European Union is one of the few nations with a carbon tax which requires manufacturing companies to take permits for producing goods that have GHG emissions. This automatically increases the price of the goods manufactured in the EU and thereby making it cheaper to import goods from nations where there is no such taxation on GHG emissions. However, the EU is planning an implementation of the 'Carbon Border Adjusted Mechanism' (CBAM) which involves the taxation of goods that are entering the EU which emit carbon (Huang *et al.*, 2022). These imposed tariffs on cross-border goods would increase their price and create a balance among the products being manufactured in the EU. India is the third largest trading partner of the EU accounting for more than \$70 billion worth of trade in the last three years. India goods have had a competitive advantage in the EU market since they are priced lower but CBAM can increase these prices leading to a decline in the demand for the goods in the EU market (Lin and Zhao, 2023). Similarly, the US is also considering similar measures to reduce the difference in the goods produced in the nation.

India needs to consider that with countries adopting cross-border carbon tariffs, the demand for Indian goods would fall in those markets and this would have serious implications for export-based businesses in the country. However, this situation can be addressed by compelling Indian manufacturers to produce goods in a sustainable manner which would exempt them from cross-border carbon tariffs. An explicit carbon tax policy is something that can help the nation in this context and prepare it for a future where the majority of India's trading partners have implemented the particular policy.

Challenges involved with the implementation of an explicit carbon tax in India

The carbon pricing mechanism in India or the Cess tax or the implicit carbon tax that has been implemented by the government has been unable to reduce the emissions of GHGs in the atmosphere. The policies and initiatives undertaken by the government are not enough for reducing the carbon emission of its GDP by 30% by 2030 as the target set by the government of the country (Den Elzen *et al.* 2019). The implementation of an explicit tax on carbon emissions can provide the much-needed push to the nation in the way of meeting its goal. The implicit tax of India is one of the lowest in the world at just 1.6/tonne CO₂ emissions. An explicit tax would lead to an increase in this rate and this in turn would go a long way in reducing emissions while setting an example for the rest of the world. A higher revenue would be generated by the nation which would further lead to proper investment to make the required shift towards renewable energies (Elaouzy and El Fadar, 2023). Hence, the implementation of the explicit tax is an important step towards achieving the set goals and staying true to the agreements made at the global level. However, the implementation of an explicit tax is not an easy task in a developing country like India and faces a lot of challenges.

The biggest challenge with the carbon tax is the potential impact that will have on the economy of the country. The economy of the nation is developing with significant investments being made in the manufacturing sectors to increase productivity and generate employment. However, a higher or explicit tax can increase the costs of production and this in turn would increase the prices of the products for the customers (Prasad, 2022). Foreign companies might refrain from making the required investments in the nation due to the high cost of production and look for other suitable options. India is at the top of the list of countries with the lowest production or manufacturing costs and the position of the country has improved on the Ease of Doing Business (EODB) index. However, the explicit tax would only increase the production costs in the nation and also affect its position in the global index. Further, the majority of the electricity needs of the country is met using coal and thus the heavy reliance on coal would also be affected by the implementation of the carbon tax.

The next challenge that is faced by the nation is the lack of accurate data on GHG emissions. India is a nation with a large number of small and medium-sized businesses that do not have the knowledge and resources to measure carbon emissions in an effective manner (Bhat. and Mishra, 2020). Hence, designing an explicit policy that is equal and effective becomes quite challenging. On the other hand, even if the tax is implemented by the nation, then there still remains the challenge of using the revenue generated through the tax in an effective manner. As it has already been witnessed with the Coal cess, the funds generated with the help of the implicit tax remain unutilised to a great extent. Similarly, the revenue generated from the explicit tax would face this challenge where it is not used in a fair manner. Hence, all of these challenges need to be considered in an effective manner while taking the most necessary steps towards the implementation of an explicit tax on carbon emissions.

Strategies for effective implementation of an explicit carbon tax in India

Irrespective of the challenges involved with implementing an explicit tax, there are compelling reasons for the implementation of the tax. The revenue generated in the process can be used to fund numerous renewable energy projects and make the transition towards cleaner energy in an efficient manner. It is something that can

motivate companies to implement green strategies and reduce their footprint in the process. India can also set an example to the world with its explicit policies and emerge as a key player in fighting climate change. However, any policy that can have an impact on the Indian economy must be handled and implemented with care. All of these things must be considered in an effective manner to ensure that the policy does not have an adverse impact on the developing economy.

The adverse impact on the economy is the primary reason behind India not having an explicit policy on carbon emissions. However, experts believe that a carbon policy that is well-thought and designed can not only mitigate climate change but also aid the growth of the economy. Hence, there are certain strategies or elements that need to be taken into consideration for the implementation of the tax policy in an effective manner. The first thing that needs to be well-thought is the agreement on the appropriate tax rate related to carbon emissions. The World Bank mentions that a carbon tax rate of \$40/tonne of CO₂ has the potential to reduce the emissions by 1.7 billion tonnes by 2030 and this is approximately 30% of the projected emissions of the Indian economy. Hence, with the help of this tax rate, India would not only be able to meet its global target but also generate a large amount of revenue in the process that can support renewable and cleaner energy projects.

The next thing that needs to be considered in the process is making sure that the explicit tax is equitable and does not have a greater impact on the lower-income households of the country. This can further be done by providing relevant subsidies to the lower income households regarding any rise in energy costs due to the carbon tax (Ionescu *et al.* 2020). Further, maintaining the highest level of transparency in the process is important for the successful implementation of the tax. Transparency will help in building trust with the relevant stakeholders while reducing corruption and mismanagement of the revenue generated (Chen *et al.* 2022). On the other hand, it is also important for the government of the country to simplify the current tax system to address the challenge of implementing the explicit tax. The tax system of India is quite complex and thus it is only appropriate to consider integrating the explicit tax into the existing tax regime of the nation which is the GST (Goods and Services Tax). Hence, all of these strategies would help with the effective implementation of the carbon tax.

IV. Discussion

Coal Cess along with other carbon pricing mechanisms have often been referred to as carbon tax in India with the goal to reduce the carbon emissions in the country and play a key role in mitigating climate change. However, all of these taxations are implicit in nature and there is no explicit tax that has been levied by the country on carbon emissions. India is not among the countries in the world to have an explicit tax in the way of reducing emissions despite being one of the biggest emitters of carbon dioxide. However, efforts have been made by the country to address the issues with various plans and policies developed to address the issue of climate change. The implicit carbon tax of 400/ton of CO₂ emission from coal is one such example of the measures adopted by the nation. However, these policies have been ineffective in reducing the GHG emissions of the country which have only increased over the years. There is a need for India to have an explicit tax to reduce emissions and become a key player in the fight against climate change. An explicit tax based on international standards is the only way for the nation to reduce emissions but it still comes with various challenges. The explicit tax can have a negative impact on the nation's economy while also being complicated to implement due to a lack of accurate data. However, with the help of appropriate strategies and measures, an explicit tax could be implemented that can aid the sustainable development of the nation. A well-designed policy with a higher level of transparency and proper integration into the tax structure of the nation can help in the implementation of a carbon tax with higher efficacy. India would be able to generate higher revenues with the help of explicit tax and this further can make it easy for making the necessary investment towards renewable energies. Hence, it can be said the implicit tax that India has put on carbon has been ineffective in reducing the carbon emissions and thus an explicit tax needs to be implemented which would be more effective in reducing the emissions.

V. Conclusion

The paper has provided a clear idea of the efficacy involved with the implementation of the carbon tax in India with the help of secondary sources of information. With the growing concern about climate change and global efforts to reduce GHGs emissions, it is only imperative that the discussion around carbon tax is only going to increase with global institutions like the UN calling for an explicit carbon tax for all nations. Hence, there is still a lot that can be explored regarding this topic in the future like the impact that carbon tax would have on trade and commerce of the world. Future research can focus on developing an appropriate framework for the successful implementation of a carbon tax in a nation. Till then, it can be said that India needs to consider an explicit tax for reducing carbon emissions.

Reference list

- [1]. Bhat, A.A. And Mishra, P.P., 2020. Evaluating The Performance Of Carbon Tax On Green Technology: Evidence From India. *Environmental Science And Pollution Research*, 27, Pp.2226-2237.
- [2]. Bureau Of Energy Efficiency, 2023. Perform Achieve Trade (PAT). Available At: [https://Beeindia.Gov.In/En/Programmes/Perform-Achieve-And-Trade-Pat#:~:Text=Perform%2C%20Achieve%20and%20Trade%20\(PAT\)%20is%20a%20regulatory%20instrument,Saving%20which%20can%20be%20traded.](https://Beeindia.Gov.In/En/Programmes/Perform-Achieve-And-Trade-Pat#:~:Text=Perform%2C%20Achieve%20and%20Trade%20(PAT)%20is%20a%20regulatory%20instrument,Saving%20which%20can%20be%20traded.) [Accessed On: 31st July 2023]
- [3]. Chen, L., Msigwa, G., Yang, M., Osman, A.I., Fawzy, S., Rooney, D.W. And Yap, P.S., 2022. Strategies To Achieve A Carbon Neutral Society: A Review. *Environmental Chemistry Letters*, 20(4), Pp.2277-2310.
- [4]. Den Elzen, M., Kuramochi, T., Höhne, N., Cantzler, J., Esmeijer, K., Fekete, H., Fransen, T., Keramidis, K., Roelfsema, M., Sha, F. And Van Soest, H., 2019. Are The G20 Economies Making Enough Progress To Meet Their NDC Targets?. *Energy Policy*, 126, Pp.238-250.
- [5]. Elaouzy, Y. And El Fadar, A., 2023. Role Of Carbon Tax In The Widespread Integration Of Sustainable Strategies In Buildings. *Building And Environment*, 234, P.110182.
- [6]. Geroe, S., 2019. Addressing Climate Change Through A Low-Cost, High-Impact Carbon Tax. *The Journal Of Environment & Development*, 28(1), Pp.3-27.
- [7]. Hickmann, T., Widerberg, O., Lederer, M. And Pattberg, P., 2021. The United Nations Framework Convention On Climate Change Secretariat As An Orchestrator In Global Climate Policymaking. *International Review Of Administrative Sciences*, 87(1), Pp.21-38.
- [8]. Huang, T., Liu, Z. And Zhao, T., 2022. Evolutionary Game Analysis Of Responding To The EU's Carbon Border Adjustment Mechanism. *Energies*, 15(2), P.427.
- [9]. IMF, 2022. More Countries Are Pricing Carbon, But Emissions Are Still Too Cheap. Available At: <https://www.imf.org/en/Blogs/Articles/2022/07/21/Blog-More-Countries-Are-Pricing-Carbon-But-Emissions-Are-Still-Too-Cheap> [Accessed On: 31st July 2023]
- [10]. Indian Energy Exchange, 2023. RENEWABLE ENERGY CERTIFICATES. Available At: <https://www.ixindia.com/products.aspx?id=5%2fpxgqpnjo0%3D&Mid=IT8b%2BZM5cBA%3D> [Accessed On: 31st July 2023]
- [11]. Ionescu, L., 2020. The Economics Of The Carbon Tax: Environmental Performance, Sustainable Energy, And Green Financial Behavior. *Geopolitics, History, And International Relations*, 12(1), Pp.101-107.
- [12]. Lin, B. And Zhao, H., 2023. Evaluating Current Effects Of Upcoming EU Carbon Border Adjustment Mechanism: Evidence From China's Futures Market. *Energy Policy*, 177, P.113573.
- [13]. Malik, A., Bertram, C., Despres, J., Emmerling, J., Fujimori, S., Garg, A., Kriegler, E., Luderer, G., Mathur, R., Roelfsema, M. And Shekhar, S., 2020. Reducing Stranded Assets Through Early Action In The Indian Power Sector. *Environmental Research Letters*, 15(9), P.094091.
- [14]. Meena, P.L., Vinay And Sehrawat, A., 2021. Sustainable Energy Policies Of India To Address Air Pollution And Climate Change. *Energy: Crises, Challenges And Solutions*, Pp.169-181.
- [15]. Metcalf, G.E., 2019. On The Economics Of A Carbon Tax For The United States. *Brookings Papers On Economic Activity*, 2019(1), Pp.405-484.
- [16]. Ojha, V.P., Pohit, S. And Ghosh, J., 2020. Recycling Carbon Tax For Inclusive Green Growth: A CGE Analysis Of India. *Energy Policy*, 144, P.111708.
- [17]. Prasad, M., 2022. Hidden Benefits And Dangers Of Carbon Tax. *Plos Climate*, 1(7), P.E0000052.
- [18]. Ravindranath, N.H., Chaturvedi, R.K. And Kumar, P., 2017. Paris Agreement; Research, Monitoring And Reporting Requirements For India. *Current Science*, Pp.916-922.
- [19]. Tiseo, I., 2023. GHG Emissions In India 1990-2020, By Sector. Available At: <https://www.statista.com/statistics/1282650/India-Ghg-Emissions-By-Sector/> [Accessed On: 31st July 2023]
- [20]. Tyagi, R., Agrawal, A. And Ali, S.S., 2018. Indian Renewable Energy Act 2015: A Step Towards Reducing Carbon Footprint. *Indian Journal Of Power And River Valley Development*, 68(9/10), Pp.145-151.