

Discussion Paper

Policy Measures for Reducing Possible Regressive Impacts of a Carbon Tax in India



2024

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About Project:

Assessing the Feasibility of Instituting an inclusive Carbon Tax Policy in India

The project intends to build a holistic understanding of the need for, and the trade-offs associated with instituting a Carbon Tax in India. The project has four key objectives around assessing feasibility of Carbon Tax.

This discussion Paper under objective three, suggest policy measures for reducing regressive impacts of Carbon Tax and inclusive transition. This paper discusses possible regressive impact for India and suggest way forwards based on learnings from various countries' experiences with Carbon Tax.

Disclaimer: Views expressed in this policy note are those of the authors and do not necessarily represent the positions of CBGA and its affiliates

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Annexure 1: Different Countries' experiences measures to reduce regressive impact of their Carbon Tax Policy



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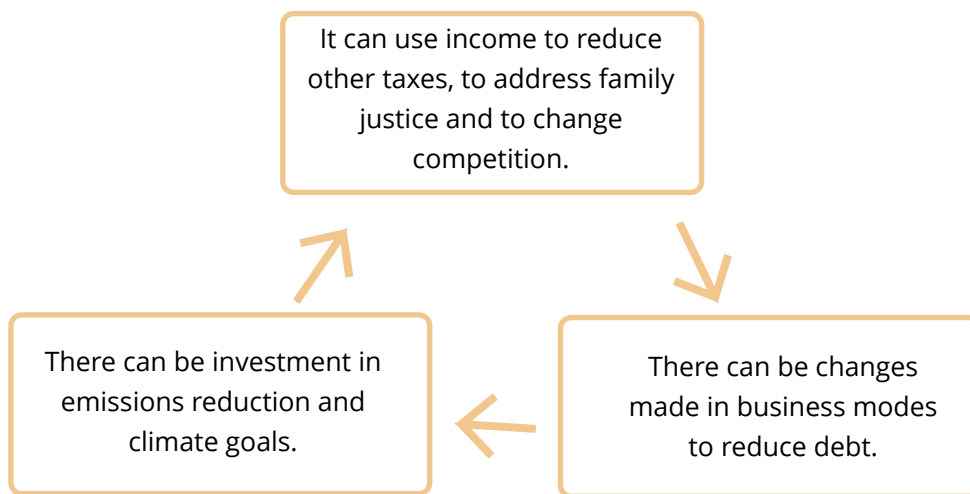


1.1.0 Context

Climate change is one of the main challenges facing us today. To reduce emissions of greenhouse gases (GHGs), and thereby mitigate climate change, the exploration of new and alternative mechanisms becomes crucial. Carbon pricing emerges as a pivotal instrument, addressing the external costs of greenhouse gas emissions and reallocating responsibility for the associated damages to their source. The environmental and economic efficiency of Carbon Taxation is often highlighted, but it is important to understand how the burden from a Carbon Tax is shared across households, stakeholders, and businesses since it might be regressive for certain segments of the population.

Inclusivity is the backbone of sustainable development. Carbon Tax is extremely effective in abating carbon emissions, but it leads to an undesirable trade-off between economic growth and climate change mitigation.

Figure 1: Advantages of implementing a Carbon Tax.



As of 2023, 28 countries have rolled out a multitude of mechanisms to tax carbon emissions and subsequently target the carbon content in energy consumption¹. According to the World Bank, there are 68 direct carbon pricing instruments operating as of June 2022 in 46 national jurisdictions around the globe. These comprise 36 Carbon Tax regimes and 32 emissions trading systems².

In India, at least 13 million people in the poorest regions depend on the coal ecosystem for a living³. A critical aspect of a good Carbon Tax policy is in ensuring equity and minimising impact on low-income households. However, there is no negating that a Carbon Tax could raise a significant amount of revenue: 1-2 per cent of GDP for a US\$ 35 per ton of CO₂ in 2030⁴. Such financial heft can help offset the harmful macro-economic effects and drive a sustainable

Although India is the third-largest emitter of CO₂⁵, after China and the United States, **the country does not have an explicit Carbon Tax in place**. India's carbon emissions are set to surge 50% by 2030 due to rising electricity and transportation demands, emphasising its crucial role in combating global warming. A nationwide Clean Environment Cess, akin to a Carbon Tax, was introduced on coal, lignite, and peat in 2010. Implementing a Carbon Tax of US\$40 per tonne of CO₂ e ,could potentially reduce emissions by up to 1.7 billion tonnes by 2030 equivalent to 30 per cent of India's projected increase.⁶ This tax rate would also generate significant revenue for the government, which could be used to support clean energy development and climate adaptation measures including loss and damage response financing. The major inhibition of the India to adopt Carbon Tax is general trend of regressivity associated with Carbon Tax particularly burdening the poor population and vulnerable socio- economic segments of its population.⁷

India, grappling with low per capita income and limited energy access primarily focuses energy consumption on essentials like cooking and lighting with minimal commuting. However, implementing a Carbon Tax raises concerns about regressive impacts disproportionately affecting poorer households due to increased energy prices necessitating careful consideration in design and implementation. There are currently several proposals being considered by the Government of India for a nationwide roll-out of carbon markets. These are based on a cap-and-trade system like the European Union's Emissions Trading System (EU-ETS) for certain sectors. Such measures will require amendments to the Energy Conservation Act 2023.⁸ Further, an explicit system of domestic Carbon Tax might also be imposed as a way to comply with the upcoming CBAM (Carbon Border Adjustment Mechanisms) rules imposed by the EU.⁹ Until now, emissions trading has been the carbon pricing instrument of choice in most jurisdictions.

In the EU, the ETS covers nearly half the total greenhouse gas emissions. Similar to a Carbon Tax, cap-and-trade programmes impose a price on carbon emissions, affecting consumers, shareholders, and workers, potentially leading to regressive impacts on lower-income segments. Policymakers must carefully assess how these costs are distributed across different groups and income classes when considering implementing a carbon pricing policy like a Carbon Tax in India.

Navigating the multifaceted and wide-ranging regressive impact of a Carbon Tax demands a nuanced strategy. From its effects on low-income households and small enterprises, to its implications for export competitiveness and domestic inequality, addressing these concerns requires a thoughtful approach. To counteract the negative externalities, a set of mitigating mechanisms exist. Crafting region- and sector-specific policies, informed by international experiences, can enhance the effectiveness of this crucial climate change mitigation tool.

1.1 Objectives

Keeping this in mind, this discussion paper covers two key objectives for drawing up a way forward for a socio-economic benefit and inclusive Carbon Tax policy in India.

The first objective is to review the policy measures adopted in different developing countries and collate learning from international experience for compensating adversely affected sections of the population. And the second objective is to attempt for devising policy for mitigating regressive-ness measures suited to the Indian context based on learning, especially from developing countries.



2.0 Methodology and Approach

A review of several studies was carried out on the potential regressive effects of a Carbon Tax on socio-economic indicators for various countries including India.

To understand how to compensate populations affected by Carbon Taxes, a comprehensive review of global policies was carried out using a secondary literature survey. The analysis delved into the implementation strategies of about 30 countries, examining unique approaches, challenges, and lessons learned. The information is compiled in the annexure of this discussion paper. For ease of understanding, the countries have been segregated as developing and developed countries as per the classification of the United Nations (UN).¹⁰

Additionally, mitigation measures were assessed for their applicability and effectiveness in the Indian context, considering socio-economic factors and policy frameworks of a few developing countries that had adopted a Carbon Tax. Clear criteria were established to differentiate between developed and developing countries, considering economic indicators and industrialisation levels, while studying their measures on mitigating the repressiveness of a Carbon Tax. This holistic approach aimed at providing insights for an India-specific strategy.



3.0 Findings of various studies: Possible Regressive Impacts of Carbon Tax for India

Several studies have revealed that carbon pricing mechanisms in developed countries often result in the negative. In most developed nations, the wealthier individuals spend less on energy, but for those with lower incomes, energy expenditures constitute a larger proportion of disposable income. Consequently, lower-income households may encounter challenges in adopting emission reduction measures, as they may find it difficult to afford improvements for

poorly insulated homes, less energy-efficient appliances, or vehicles with low fuel economy. However, these challenges are manageable through designing an inclusive Carbon Tax and using a Carbon Tax revenue neutral approach. The following sections discuss the possible regressive impact of Carbon Tax.

3.1 Impact for rural and urban poor

In contrast, the scenario varies notably in developing countries. A significant contributing factor to this difference is the distinctive pattern of energy spending between urban and rural households. Higher-income developing countries often have a more urbanised population than lower-income countries. Unlike in rural households, urban households primarily depend on transportation and lack access to untaxed energy sources, such as biomass. The urban poor could face disproportionate challenges due to carbon pricing unless relief measures are instituted. In the initial part of the 1990s, nations including Denmark, Norway and Finland implemented energy taxes that were based on carbon content. In 2008, the Canadian province of British Columbia imposed a Carbon Tax and worked to mitigate the regressive impact on its rural populations.¹¹

3.2 Double-dividend impact for economic and environmental dimensions

The stories from the developing world towards achieving sustainable goals are also inspiring. Chile is the first country to implement a Carbon Tax in South America and was also the first to roll out green bonds in the region. It is a common finding in Economics literature that Carbon Taxes are regressive in its impact. The distributional effect may undermine the political acceptability of the tax. A Carbon Tax in France contributed to the “Yellow Vest” protest. Mexico also witnessed a minor regressive effect¹². On the flip side, the approach of double-dividend hypothesis reflects upon economic and environmental dimensions and can help formulate balanced measures to respond to the regressive impact. The dividends of these corrective measures are also visible in the form of sustainable development and a better future to leave behind.¹³

3.3 Impact on households due to transition to sustainable fuels

In India, households navigate the use of multiple fuels to meet their energy needs, requiring decisions not only on the quantity but also the type of fuel to employ. Energy stands as a fundamental necessity for households, with a surging demand for cooking and lighting in the country. A 2022 study conducted by R. Maheshwari on Economic, Sustainable Development, and Fuel Consumption delves into the economic, sustainable development, and fuel consumption dimensions of Indian households.¹⁴ The findings indicate that transitioning to sustainable fuels would yield mixed impacts at the household level. Despite the environmental benefits of cleaner fuels, the economic costs also tend to disproportionately burden the poor. Studies in the developing world, like Aggarwal et al., 2021, explore the socio-economic impact of Carbon Tax, revealing critical trade-offs between climate change mitigation and economic

development. The research highlights significant reductions in demand for various energy sources alongside regressive welfare effects, emphasising the need for nuanced policy responses to mitigate adverse impacts on vulnerable households.

3.4 Impact on essential commodities prices

The paper "Green Growth and the Right to Energy in India, 2021" by Rohit Azad, highlighted that New Delhi remains the most polluted city globally, showing no significant improvement over time.¹⁵ Azad suggests introducing a Carbon Tax in Delhi to shift the city's economy toward clean and sustainable energy sources. This strategy aims to ensure universal access to electricity, transportation, and food up to a certain level. A study analysed the carbon prices associated with commodities in the National Sample Survey (NSS), revealing that as income levels rise, the lower-income sections would be more adversely affected by a Carbon Tax due to a higher proportion of expenditure on household goods and food.

3.5 Impact on industrial competitiveness

A study of British Columbia's Carbon Tax has found very limited impacts on industrial competitiveness, which is now home to a growing clean energy sector with more than 200 companies that generate an estimated US\$ 1.7 billion in revenue annually¹⁶. Most ex-post empirical studies find no statistically significant effects of carbon pricing on different dimensions of competitiveness. Also, Pearson and Smith (1991) studied that the distributional effects of a Carbon Tax equivalent to US\$10 per barrel of oil would have a regressive impact for Ireland and the United Kingdom¹⁷. The adoption of a Carbon Tax is likely to affect firms engaged in energy-intensive outputs significantly. It would inflate their production cost, which would lead to loss of competitiveness.

3.6 Impact on government revenues from fuels

India, the world's third-largest oil consumer, currently consumes approximately 5 million barrels daily, with a growth rate of 3-4 per cent annually. Projections suggest that within a decade, this consumption could surge to about 7 million barrels per day. The Petroleum Planning and Analysis Cell (PPAC)¹⁸ reported a rise in crude oil imports to 212.2 million tonnes in 2021-22 from 196.5 million tonnes in the previous year. Despite efforts to boost output, the oil import dependence for April 2022-23 reached 86.4 per cent, marginally up from the corresponding period last year. The escalating demand for oil is outpacing production, leading to concerns about a heightened crude oil import bill, with potential repercussions on macroeconomic indicators.¹⁹ This trend also reveals the vulnerability of the sector which could fluctuate with global dynamics and a need for diversification.

Table 1: Revenue from coal and petroleum at Union level along with Government of India (GoI) revenue (In Rs crore)

Source of GoI Revenue	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
From Coal India	42143	43946	39498	34705	41768	40357
From the petroleum sector	336163	348041	334315	455069	492303	428067
From the fossil fuel sector	378306	391988	3373812	489774	534071	468424
GoI revenue	2111753	2316170	2337216	2234734	3074427	2414860
Percentage share of fossil fuel revenue	18%	17%	16%	22%	17%	19%

Source: Coal India financial report and Petroleum Planning and Analysis Cell, GoI-Government of India

3.7 Impact on employment and electricity price

As coal-based energy production becomes more expensive, power generation companies may transfer additional costs to end-users, electricity price might increase, potentially straining budgets and altering consumption patterns. The ripple effect could extend to industries heavily reliant on coal, such as manufacturing, cement, and steel, potentially diminishing profitability, eroding competitiveness, and leading to reduced output and job implications. This, in turn, may affect the overall investment attractiveness of coal-related industries, contributing to potential declines in employment and economic growth.

3.8 Expected impact on trade competitiveness.

An additional tax does inflate the production cost and this leads to reduced trade competitiveness in the international marketplace. In 2022, India exported a total of US\$ 468 billion and ranks fifteenth in the world²⁰. In 2022, 27 per cent of India's exports of iron, steel, and aluminium products worth US\$ 8.2 billion went to the E²¹. India's steel sector faces significant challenges due to the EU's carbon border tax, which could cost up to US\$ 8 billion in exports to the EU. The country's manufacturing industry is expected to face increased tariffs on iron, steel, aluminium, and cement. Compliance with the Carbon Border Adjustment Mechanism (CBAM) would require taxes on carbon emissions and fair competition. India's sustainable commitment and sectoral compliance with CBAM could lead to innovative solutions and improved domestic scenarios.



4.0 International experiences and policy measures on mitigating regressive impact of a Carbon Tax

As per the World Bank dashboard²², a total of 28 countries have implemented an explicit Carbon Tax. This is the tax directly placed on the greenhouse gases emitted from various sources. Uruguay has the world's highest Carbon Tax rate as on March 31, 2023, at nearly 156 US\$ per metric ton of CO₂ equivalent (US\$/tCO₂e). By comparison, Poland had a tax rate of less than 1 US\$/tCO₂e, while Finland – the world's first country to implement a Carbon Tax – had a rate of some 84 US\$/tCO₂e.²³

Table 2: List of countries where a Carbon Tax has been implemented

S.No.	Country	Year of Enactment	Carbon Tax Rate (US\$ 2023)
Developing Countries			
1	Argentina	2018	6
2	Chile	2017	5
3	Columbia	2017	5.06
4	Mexico	2014	4.07
5	South Africa	2019	8.99
6	Uruguay	2022	155.78
7	Argentina	2018	6
8	Chile	2017	5
9	Singapore	2019	5
Developed Countries			
10	Canada	2008	48.03
11	Denmark	1992	27
12	Estonia	2000	2
13	Finland	1990	83.74
14	Iceland	2010	39
15	Ireland	2010	53
16	Japan	2012	2
17	Latvia	2004	16
18	Liechtenstein	2008	131
19	Luxembourg	2021	48
20	Netherlands	2021	56
21	Norway	1991	91
22	Poland	1990	14
23	Portugal	2015	26
24	Spain	2014	16
25	Sweden	1991	125.56
26	Switzerland	2008	131

Source: Authors' compilation from World Bank Carbon Pricing Dashboard as on February 2024

Note : Australia and Indonesia not included in this list since they rolled back Carbon Tax recently.

A complete repository of different countries that highlights the key features of a Carbon Tax in both a developing and developed country and how it has been priced based on the objective of the tax has been created (Annexure1). Several countries have focused on recycling measures which are progressive and aim to protect the vulnerable and low-income segments of the population from the potential regressive impacts of implementing a Carbon Tax. A summary of approaches taken by various developed and developing countries in consideration of mitigating regressive impact of Carbon Tax are discussed in subsequent two sub-sections.

4.1 Approaches taken by developed countries.

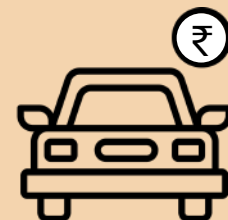
This section looks at the countries, mostly from the European Union (EU), that already have a Carbon Tax in place for more than a decade and developed countries. Most of the countries under the EU had exempted certain fuels and sectors from the Carbon Tax. For example, Denmark has exempted electricity and EU-ETS participating sectors from the Carbon Tax. The levy complements the EU-ETS scheme in this case, with this exemption criteria and at the same time managing the possible regressive impact of Carbon Tax. Certain countries have followed a graduated increase in Carbon Tax rate over the years and the partial coverage of sectors.²⁴

Box1: Case study: Sweden and Canada's experience with Carbon Tax

Case 1 of Sweden: "Despite the high Carbon Tax on transport sector, the Sweden economy continued to grow faster"

Sweden is one of the first countries in the world to implement a Carbon Tax in 1991. It was introduced at the level of US\$30 per ton of CO₂ and then successively increased to today's rate of US\$132, currently one of the highest Carbon Taxes in the world. The tax revenue from Sweden mainly comes from the transportation sector. Around 90 per cent of the revenues from the Carbon Tax comes from the consumption of gasoline and motor diesel. Furthermore, sectors such as industry and agriculture also are required to pay a lower Carbon Tax.

Despite the high Carbon Tax, the Swedish economy has continued to grow at a faster rate than the European average. This outcome challenges the notion that environmental regulations or policies aimed at reducing carbon emissions inevitably hinder economic growth. Instead, despite the **high Carbon Tax on transport sector, the Sweden economy continued to grow faster rate.**



Case 2 of Canada: “Tax structure differs depending on the province’s geopolitical situation and public opinion”

The Carbon Tax first started in British Columbia (BC) in Canada. The emergence of a Carbon Tax in BC reflected a confluence of political conditions ripe for Carbon Taxation: availability of untapped hydro potential, a surge in public concern for climate change, a committed leader with the institutional capacity to pursue his personal policy preferences, and a right-of centre government with the trust of the business community.

Interestingly, BC's GDP growth during this period was on par with the national average. The province also attracted double the national rate of investment in clean energy and hybrid vehicles, and now enjoys the lowest corporate and individual income taxes in Canada. Industries with high emissions, such as cement production, petroleum refining, oil and gas extraction, and certain manufacturing sectors, were most impacted by the tax. It is worth noting that the tax rate and its reception can depend on the geopolitical situation and public opinion in each region. The structure of the tax differs depending on the province in Canada. Some provinces have implemented the federal Carbon Tax, some have an alternative regional Carbon Tax, and others are currently involved in a legal process that aims to avoid the implementation of a Carbon Tax. However, all Carbon Taxes upon implementation seem to follow a similar structure. **There is a single Carbon Tax rate for smaller businesses and households while industrial emitters face a separate carbon pricing scheme based on a portion of their emissions rather than on fuel purchases.**



Sweden's experience demonstrates that it is possible to achieve economic growth while simultaneously reducing GHG emissions through appropriate policy measures. Canada's example suggests that tax structuring can be done considering the province’s geopolitical situation and public opinion to mitigate regressive impacts. Several countries like Denmark and the Netherlands had exempted certain sectors participating in EU-ETS from Carbon Tax. Most of the countries opted for revenue recycling for various purposes. Countries like Switzerland, Sweden, Denmark, Ireland and France have either used their Carbon Tax revenue to lower household bills or allocated it for spending on green infrastructure. Under the Carbon Tax plans, the Netherlands government proposed a price of €30 per ton of CO₂ in 2021. The price will increase so that in 2030, steel industries, oil refineries and chemical companies will pay €125 for a ton of CO₂. The final tax price will be the difference between the price per ton of emitted CO₂ under the EU-ETS and the national carbon price of a certain year. This measure

helped the Netherlands government in accelerating its climate goals by complementing the carbon market under EU-ETS.²⁵ Different approaches were followed for exemption to electricity and EU-ETS participating sectors, including tax rebates to non-combustible industries, exemption to fuels which might burden households' income or are used in small electricity generating stations and comprehensive measures for Carbon Tax revenue recycling. Box1 provides a compilation of such measures in the case of Sweden and Canada. Unlike other countries, all the UK's receipts have disappeared into general funds²⁶ or the state treasury.

4.2 Approaches taken by developing countries

Studies suggest that Carbon Taxes in developed nations tend to have regressive effects, while developing countries experience mild progressive effects. However, there is limited experience with Carbon Taxation in developing countries. Only 3 Per cent of lower- and middle-income countries have implemented or plan to implement Carbon Taxation.²⁷ A compilation of mitigation approaches from developing countries.

Table 3: Developing Countries' Experience

Developing Country	Key mitigative measures
Mexico	Strategic adoption of climate mitigation as an objective: Framing of Carbon Tax as a climate change mitigation measure, rather than solely a revenue-raising tool, garnered public support and made it more acceptable among the political circles of the country.
Colombia	Tax exemption to certain fuels in upstream usage and offset projects: The Carbon Tax is applied to fossil fuels based on their carbon content, covering petroleum derivatives and fossil gases used for combustion. Entities proving carbon neutrality by offsetting emissions from taxed fuels are exempt, while coal faces taxation upon sale or withdrawal for personal use.
India	Importance of monitoring underutilisation of coal cess revenues: The initial cess was Rs 50 per tonne underwent multiple increases and was revised to Rs 400 per tonne in five years. The funds initially directed towards renewable energy expansion were later integrated into tax reforms, alongside sub-national compensations. There was strict earmarking of revenue solely for climate mitigation efforts however it raised concerns about its efficient utilization and required proper monitoring of expenditure of funds.
Uruguay	Revision in tax target based on inflation: Uruguay implemented the highest rate globally at UYU5,645.45/tCO ₂ for the year 2022. The tax targets emissions from fuel combustion (excluding jet fuel) and may fluctuate based on inflation or fuel prices, which reduces its negative impact on citizens.
South Africa	Delay roll out and tax rate adjustment with currency rate: Africa demonstrated a nuanced approach to balance global alignment and economic stability by delaying the second phase to January 2026 and going for rate adjustment with recent Rand-based rate increases in Carbon Tax, deviating from the initially proposed US dollar linkage.

Developing Country	Key mitigative measures
Argentina	Revision in mitigative measures: Initially, the revenue generated served multiple beneficiaries, such as the National Housing Fund, the Transport Infrastructure Trust, and the social security system. However, it was eventually decided to divert 100 per cent of the revenue to the national and sub-national governments, which resolves the vertical fiscal imbalances generated by the gaps between expenditure and revenue-generation through inter-governmental transfers ²⁸
Chile	Tax exemption to small scale units: The reform is restricted to large industrial and power generation sources with thermal power greater than 50 megawatts (MW).
Singapore	Gradual increment in Carbon Tax: The Carbon Tax rates will be raised from \$50 to \$80 per tonne by 2030.

Source: Author compilation from various sources.

Note: Details available in Annexure 1

Box 2: Case study: Policy introduction as climate change mitigation and lump sum allocation of carbon tax funds in Mexico and Indonesia

Case 1 of Mexico: “Carbon Tax originated from climate law and presented to public as environment friendly and economically rational policy”. Mexico experiences suggest that framing of Carbon Tax as a climate mitigation measure can help in garnering public support.

Mexico, as an emissions-intensive economy facing global competition, marked a historic milestone by becoming the first developing nation to implement a Carbon Tax. This decision was anchored in the comprehensive legislation package known as the General Law on Climate Change, enacted in 2012. This law aimed to coordinate Mexico's response to climate change, setting targets across sectors and fostering sustainable development. The adoption of the Carbon Tax was strategically framed as an environmentally friendly and economically rational policy, gaining support from the Ministries of Environment and Finance. The tax's presentation to the public focused on climate change mitigation rather than revenue generation, leveraging environmental appeal for broader acceptance and overcoming opposition within the industrial policy subsystem. This framing, emphasizing long-term environmental benefits over short-term economic costs, played a pivotal role in garnering public support and neutralizing opposition.



Case 2 of Indonesia: “Uniform lumpsum distribution of revenues proved progressive”

Indonesia had developed a Carbon Tax policy and adopted it in 2022, which is no longer in effect. It follows the emission trading system today. The emission trading system (ETS) in Indonesia had a more pronounced impact on urban households than on rural ones. In rural areas, the effect was characterized as progressive, with poorer households experiencing relatively more benefits than wealthier ones. In urban areas, the distributional outcome hinged on the method of redistributing the revenue generated from the Carbon Tax. When uniform lump sum transfers were implemented, the impact remained progressive. These changes not only contributed to mitigating climate change but also improved the efficiency and productivity of the sector, as rural areas often concentrated more on agricultural activities and lower-income households. Indonesia taken uniform lump sum transfers approach of revenues and the impact remained progressive. Regarding the agriculture sector, the introduction of a carbon pricing system enhanced its efficiency.



Source: Authors' compilation from various sources.

Note : Details available in Annexure 1



5.0 Key insights from countries' experience on effectiveness of mitigation measures and Carbon Tax revenue use

Insights from international experience for policymakers emphasize the need to address the poverty and distributional impacts of carbon pricing as an integral part of reform packages. This ensures public support and protects the wellbeing of vulnerable groups. Canada's example highlights the importance of tailored strategies based on local socioeconomic vulnerability. Policy designs should align with objectives, available instruments, administrative capacity, and political environment. It is crucial to mitigate regressive impacts of Carbon Tax through appropriate measures, which can vary between countries and purposes. Some important insights can be seen below.

Adopting a gradual approach to carbon pricing reforms, which allows firms and households time to adjust. Carbon pricing of several recent schemes starts at very low levels, and this may reflect uncertainty about its impacts (e.g., China, Colombia, Singapore, and South Africa).

Building some mitigative measures aimed to soften the impact on firms. This includes tax cuts (British Columbia), exemptions (Colombia, France, South Africa), and low initial Carbon Tax rate (Singapore and Sweden). In the case of Colombia, the Carbon Tax covers petroleum

derivatives and fossil gas used for combustion, entities proving carbon neutrality by offsetting emissions from taxed fuels are exempt, and coal faces taxation upon sale or withdrawal for personal use.

Some countries introduced measures to support households. China, Columbia, South Africa have seen very low effects of carbon pricing which would not impact the low-income households. South Africa does not tax the household for electricity. Sweden has applied an industry-specific Carbon Tax where separate lower Carbon Taxes are applied to agriculture and other industries to support smaller industries. Revenue distribution models from Canada (The British Columbian Climate Action Tax Credit²⁹) and Finland show a tax-shifting approach without impacting household finances.

Implementing a Carbon Tax on transportation fuels can have a progressive effect. Individuals with higher income would be more impacted due to larger consumption of gasoline. This could be done initially and expanded later.

Some countries incorporate a Carbon Tax as part of a comprehensive tax reform strategy. An opportunity arises to support affected households and businesses via tax adjustments, as seen in Sweden's Carbon Tax introduction alongside broader tax reforms in the 1990s. Recent examples from Chile, Argentina, and Colombia also demonstrate integrating Carbon Taxes within comprehensive tax overhauls.

5.1 Countries' experience in Carbon Tax revenue use

Carbon revenue recycling is an important policy measure for addressing distributional impacts and in ensuring social equity. The expansion of carbon pricing in the coming decades presents an opportunity for substantial flows of carbon revenues to support investment in the developing world. According to a World Bank analysis in carbon revenue and tier utilisation, country-specific circumstances will determine appropriate use of revenues, but there are general considerations for policy makers when assessing options for revenue use.³⁰ Countries or Jurisdictions have used their carbon revenues to achieve various objectives, which generally fall into one of six categories. Tax reform, to target higher economic growth alongside lower pollution (e.g. Sweden);

1. Climate mitigation, such as investment in low-carbon technologies (e.g. Japan)
2. Pursuit of other development objectives, such as in education and health (e.g. Colombia);
3. Prevention of carbon leakage, to achieve carbon pricing's environmental and economic objectives (e.g. South Africa);
4. Assistance for individuals, households, or businesses affected by higher carbon costs, through transfers or social programs (e.g. India);
5. Debt reduction, to reduce the fiscal burden on future generations (e.g. Ireland).

Box 3: India's Direct Benefit Program for Vulnerable Households and the "Chullo Asmaan" Scheme under the District Mineral Fund

India: Implementing the world's largest direct benefit program for vulnerable household

In 2014, the Indian government moved to eliminate all diesel subsidies by fiscal year 2015-16 and implemented a tax on produced and imported coal of around Rs 400/t (US\$ 3.29/t) LPG (liquid petroleum gas) and kerosene price supports were cut in January 2015. The total estimated oil and gas subsidies in India decreased.³¹ Savings from these reforms made it possible to implement the world's largest direct benefit transfers program for vulnerable households, namely the *Pratyaksh Hanstantrit Labh (PAHAL)*. Initially implemented at reduced scale in 2013 and extended nationwide in January 2015, PAHAL has subsidised natural gas and LPG for cooking by directly transferring refunds to each consumer's bank account. India already has these examples which demonstrate that the application of reforms such as Carbon Tax can contribute towards benefitting the vulnerable, including women.



Chattisgarh State: "Chhulo Aasman" Scheme

"Chhulo Aasman" an initiative to support dreams of tribal students in the Bastar Sambhag region of Chhattisgarh. 65 tribal children have qualified for the NEET from Dantewada district in 2023. This telling example champions the cause of 'social justice' through District Mineral Foundation. The Dantewada district administration received Rs 12.68 crore for the scheme 'Chhulo Aasman' from the total disbursement of Rs 712.08 crore to the district from 2016-17 to 2021-22. As a percentage of profit of mining can change the fate of many mining affected families, similarly such initiatives can transform lives of many affected families due to comprehensive Carbon Tax roll out and subsequent green transition.



Revenue recycling, although offering economic benefits by reducing distortionary taxes and improving the economy, is complex and may lack public understanding, hindering political support for such initiatives. Additionally, there's a perception that the richest companies and individuals typically benefit the most from tax reductions³², potentially diminishing its popularity. Governments can enhance support by ensuring transparent use of revenues.



6.0 Way forwards for bringing inclusiveness in a Carbon Tax Policy for India

Drawing from international experience, it's clear that while carbon pricing is crucial, it can't be the sole solution to global climate challenges. Challenges like political resistance, public opposition, revenue recycling complexities, and economic competitiveness concerns vary regionally. India has encountered similar hurdles in its past reforms and policies, offering valuable lessons for adopting a Carbon Tax. By examining India's experiences, policymakers can devise effective strategies to navigate challenges and implement a robust carbon pricing framework. These insights underscore the importance of learning from past successes and failures to shape India's climate policy effectively.

Table 4: Key challenges to carbon pricing and preferred policy pathways for India

Challenges	Policy Pathways
Political economy considerations	Implementing a two-pronged strategy that includes taxation plus revenue recycling
Public opposition	<ol style="list-style-type: none"> 1. A fee and dividend strategy under which tax proceeds are used to pay dividends to firm and households 2. A robust strategy for communication, public dialogue, and social deliberation to allay public fears. 3. Implementation of the tax through a phased and incremental approach to gradually increase acceptability
Challenges to revenue recycling	<ol style="list-style-type: none"> 1. When revenues are directed towards green projects/ initiatives/ research, it is critical to <ul style="list-style-type: none"> – Devise a clear, transparent roadmap for identifying viable projects. – Sequester revenues to avoid carbon dependence in public finance. 2. When revenues are recycled using a fee and dividend approach, it is important to: <ul style="list-style-type: none"> – Have a clear and considered identification of size, distribution/ payment channel duration and frequency. – Ensure targeting efficiency and adequate monitoring.
Concerns regarding economic competitiveness	Protecting trade-exposed sectors.

Source: ORF Paper Pricing Carbon: Trade- off and opportunity of India³³

6.1 Considering a revenue neutral approach in India's Carbon Tax policy

This review examines international experiences with carbon pricing and highlights the crucial role of revenue recycling in its public acceptance. Many countries successfully allocate Carbon Tax revenue towards societal benefits, like funding green initiatives or directly reducing the

burden on vulnerable populations. India's experience with the coal cess emphasizes the need for efficient revenue utilization. The underutilization of funds from the National Clean Energy Fund (NCEF) underscores the importance of strategic planning before implementing Carbon Taxes. This ensures targeted use of revenue and avoids over-reliance on carbon income, as seen with the coal cess becoming a significant source for compensating for the Goods and Services Tax (GST).

6.2 Laying clear objective of Carbon Tax policy for improving political acceptability

Globally, spending Carbon Tax revenues on climate projects enhances acceptability, perceived fairness, and effectiveness. In India, despite states owning natural resources, the central government determines pricing and taxation, primarily through coal cess accruing to the Centre. The Government of Odisha has appealed for a portion of the coal cess to be shared with it, arguing that coal-bearing States bear environmental and rehabilitation costs.³⁴ Implementing a Carbon Tax can offer a holistic approach, including climate adaptation and social sector improvements, aiding the fight for net-zero emissions by 2070. Experiences from the coal cess show that the idea of revenue maximisation instead of emission mitigation could lead to an incentive mismatch and can deviate from the original objective of the Carbon Tax policy.

6.3 Considering implementation of a Carbon Tax through a phased and incremental approach

India's transition from coal to solar and wind power aligns with international climate targets, but regional disparities pose feasibility concerns. Analysing political economy constraints and understanding winners and losers at societal and state levels is essential. French experience indicates that Carbon Tax increases are not based on substantial revenue and distributional neutrality may not be viable. Most countries have taken a "low cost and high impact approach" by setting a low Carbon Tax rate. Other ways of ameliorating impacts include off-setting the Carbon Tax impacts with corresponding reductions in other taxes and ameliorating impacts on businesses (with flow-on benefits to consumers) through phased/incremental implementation.³⁵ A phased ten-year increase in Carbon Tax may be evaluated to facilitate a smoother transition, aligning with climate goals while minimizing adverse effects on households, industry, and employment.

6.4 Considering a transparent monitoring-and-evaluation framework for assessing impact

Even though a Carbon Tax would be used to mitigate the GHG emissions over time, other factors such as revenue recycling, specifying how the generated funds will be invested in environmental and climate-friendly initiatives are also an integral part of a pricing mechanism. Maintaining policy stability is vital as it offers businesses and households a predictable environ-

ment for effective planning and decision making. Continuously monitoring and evaluating the impact of the Carbon Tax and the effectiveness of compensation measures allows for timely adjustments. A local example of the importance of transparency and funds mismanagement could be derived from the state Compensatory Afforestation Fund Management and Planning Authority (CAMPA) funds which were created to increase the green cover in India and increase ecosystem services.³⁶ A total of Rs 23,607 crore was released by the Supreme Court but only Rs 2,829 crore was demanded by the state's plan of action across India. Furthermore, only Rs 1,775.84 crore could be spent by the states.³⁷ Considering a monitoring and evaluation framework for evaluating the impact of a Carbon Tax and bringing transparency is important to have an efficient Carbon Tax.

6.5 Compensating some of those who are severely affected vulnerable population beyond social safety nets.

Understanding the channels of carbon pricing impact can identify heavily affected groups, enhancing the political viability of such policies. Support measures for workers transitioning from fossil fuels could include extended unemployment benefits, training, relocation assistance, and healthcare subsidies. Policy-specific factors should guide revenue redistribution, as seen in the PAHAL scheme. Assistance for regions affected by industry closures could include reclaiming abandoned sites and temporary budget support for local governments to bridge transitions. Finance mobilisation is crucial for social goals, with green benefits outweighing costs, as demonstrated by initiatives like "*Chhulo Aasman*"³⁸ supporting tribal students in Chhattisgarh from the direct revenues of the District Mineral Fund. Such initiatives can transform lives and offer double dividends to affected communities, informing Carbon Tax revenue utilisation strategies.

6.6 Complementing with newly-launched carbon market for India and ensuring CBAM compliance

India does not have an explicit carbon price or a market-based mechanism such as cap-and-trade. It does, however, have an array of schemes and mechanisms that put an implicit price on carbon. This includes Perform Achieve and Trade, Renewable Energy Certificate, Internal Carbon Pricing, grant in aids, fuel pricing and the recently launched tradeable certificate scheme under the Carbon Market, based on the EU-ETS. Several countries like Denmark and the Netherlands have exempted electricity and EU-ETS participating sectors from the Carbon Tax.³⁹

In the Netherlands, a Carbon Tax complements the EU-ETS scheme by targeting emissions from sectors not covered by the trading system. This approach ensures comprehensive emission pricing while mitigating the potential repressiveness of the Carbon Tax through carefully designed exemption criteria. The final carbon price for a given emitter is determined by the difference between the EU ETS allowance price and the national Carbon Tax for that year. This combined approach has effectively accelerated the Netherlands' progress towards its climate

goals by going beyond the reach of the EU-ETS alone. Different approaches were followed for exemption to electricity and EU-ETS participating sectors, tax rebates to non-combustible industries, exemption to fuels which might burden households' income or exemption to fuel used in small electricity generating stations and comprehensive measures for Carbon Tax revenue recycling. A domestic Carbon Tax enroute a compliance mechanism with CBAM. Setting complimentary inclusive Carbon Tax policy with other implicit mechanisms, can foster greater acceptability of Carbon Tax and accelerate the green transition.



7.0 Conclusion

As India continues to roll out their carbon pricing schemes to meet their Nationally Determined Contributions (NDCs) under the Paris climate agreement, the analysis of policy measures taken globally offers several considerations in addressing the poverty and inequality impacts of Carbon Tax policy for India. Firstly, the country should be focusing on the pathways that are most relevant given state-specific conditions as it would be challenging to consider all pathways. Secondly, focusing initially on the pathways/ measures that have short- to medium-term effects. While many countries are taking steps to introduce carbon pricing schemes, policymakers are concerned over their uncertain impacts, particularly on households and firms. India might also need to take a review-and-reevaluate approach for channelising a Carbon Tax that is inclusive and comprehensive for achieving its climate change mitigation goals.

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