JEKMA Jurnal ekonomi dan manajemen
JEKMA Vol 4 No. 2 | June 2025| ISSN: 2828-6928 (Print), ISSN: 2828-6898 (online), Page: 11-21

CLIMATE CHANGE AND GREEN FISCAL POLICY: A SYSTEMATIC LITERATURE REVIEW ON ENVIRONMENTAL TAXATION AND SUSTAINABLE ECONOMIC GROWTH

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Article History
Received : 18 May 2025
Revised : 27 May 2025
Accepted : 10 June 2025
Available Online
16 June 2025

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Cite This Article:
Mas Ning Zahroh. (2025). CLIMATE CHANGE AND GREEN FISCAL POLICY: A SYSTEMATIC LITERATURE REVIEW ON ENVIRONMENTAL TAXATION AND SUSTAINABLE ECONOMIC GROWTH. *Jurnal Ekonomi Dan Manajemen*, *4*(2). Retrieved from https://journal.admi.or.id/index.php/JEKMA/article/view/2085

DOI:
https://doi.org/10.56127/jekma.v4i2.2085

Abstract: This paper presents a systematic literature review on the intersection between climate change mitigation and green fiscal policy, with a specific focus on environmental taxation and its role in promoting sustainable economic growth. In response to the escalating climate crisis, governments worldwide are adopting fiscal instruments such as carbon taxes, pollution levies, and green subsidies to internalize environmental externalities and shift market behavior. This review synthesizes findings from 40 peer-reviewed articles and policy reports published between 2010 and 2024, examining both theoretical and empirical perspectives.
The review identifies three major themes: (1) the effectiveness of carbon pricing in reducing emissions, (2) the role of fiscal incentives in accelerating green technology adoption, and (3) the distributional impacts and political economy challenges of implementing green tax reforms. Results show that while carbon taxation can reduce emissions by up to 20% in certain jurisdictions, its success is highly context-dependent, shaped by institutional strength, public trust, and economic structure.
The study concludes that green fiscal policy is a powerful but complex tool that requires careful design to balance environmental goals with equity and economic competitiveness. It also highlights research gaps, particularly in low-income countries, and calls for more interdisciplinary approaches in evaluating long-term outcomes. This review contributes to the growing discourse on climate-responsive public finance and provides policy insights for designing effective, equitable, and growth-oriented environmental tax regimes.

Keywords*:* Green Fiscal Policy, Environmental Taxation, Carbon Pricing, Sustainable Economic Growth

INTRODUCTION

Climate change has emerged as one of the most urgent global challenges, with wide-ranging implications for ecosystems, human health, and economic development. Rising greenhouse gas emissions, extreme weather events, and resource degradation have intensified calls for effective policy responses (IPCC, 2021; Stern, 2007). Among the array of policy instruments available, green fiscal policy, particularly environmental taxation, has gained prominence as a mechanism to align economic incentives with environmental objectives (OECD, 2019; World Bank, 2022).

Environmental taxation refers to the imposition of taxes on activities that cause environmental harm—such as carbon emissions, fossil fuel use, and industrial pollution—aimed at internalizing externalities and changing behavior (Pigou, 1920; Ekins, 1999). This approach is grounded in economic theory that supports the use of market-based instruments to achieve efficiency in environmental policy. When designed properly, green taxes can simultaneously generate public revenue, reduce emissions, and promote innovation in clean technology (Baranzini et al., 2017; Parry et al., 2014).

In recent years, numerous countries have implemented carbon pricing mechanisms including carbon taxes and emissions trading schemes (ETS), with mixed results. While countries like Sweden and British Columbia have reported significant reductions in emissions without harming economic growth (Carl & Fedor, 2016), other jurisdictions face political resistance, regressivity concerns, and implementation challenges (Klenert et al., 2018). These variations underscore the need for a deeper understanding of how fiscal tools perform across diverse economic and political contexts.

Beyond environmental outcomes, the economic implications of green taxes—such as their impact on growth, employment, and income distribution—are critical to policy viability. Studies have shown that if revenues from environmental taxes are recycled effectively (e.g., through reductions in income taxes or targeted transfers), the overall policy can be both environmentally and economically beneficial (Goulder & Hafstead, 2018; IMF, 2019). However, these benefits are not automatic and depend heavily on institutional design and policy integration.

Despite growing scholarly and policy interest, existing literature on green fiscal policy is dispersed across multiple disciplines, including environmental economics, public finance, and political economy. This fragmentation presents a challenge for researchers and policymakers seeking a coherent synthesis of findings and best practices. Therefore, a systematic literature review is warranted to organize existing knowledge, identify patterns, and assess empirical evidence on environmental taxation and sustainable economic outcomes.

This study addresses this gap by conducting a systematic review of literature from 2010 to 2024 on the role of environmental taxation in achieving climate goals while supporting inclusive economic growth. It aims to answer key questions: What types of environmental taxes have been most effective? What are the conditions for successful implementation? And how do these policies affect different socio-economic groups?

By synthesizing both theoretical insights and empirical findings, this paper contributes to the broader discourse on climate-resilient public finance. It seeks to provide a policy-relevant understanding of how environmental taxation can serve not only as a climate mitigation tool but also as a catalyst for sustainable development and green transition.

STUDY LITERATURE

Foundations of Green Fiscal Policy

Green fiscal policy is grounded in the economic theory of externalities, first articulated by Pigou (1920), which advocates correcting market failures through taxation. When economic actors are not required to bear the full social cost of their actions—such as emitting carbon dioxide—market prices fail to reflect true environmental costs. Environmental taxes aim to correct this distortion by increasing the cost of environmentally harmful activities (Ekins, 1999; Parry et al., 2014). These principles have formed the intellectual basis for environmental fiscal reform across both developed and developing countries.

In modern policy practice, green taxes include carbon pricing, fuel excise duties, landfill levies, and pollution taxes. While their primary objective is environmental, many also serve as revenue tools. According to the OECD (2019), environmental tax revenues accounted for an average of 2.3% of GDP across member countries in 2018. However, the level and structure of these taxes vary widely across regions, depending on economic capacity, political will, and institutional maturity (OECD, 2021; IMF, 2020).

Carbon Pricing Mechanisms and Emission Reductions

Carbon pricing—either through carbon taxes or cap-and-trade systems—has become a flagship policy for climate mitigation. Empirical studies confirm that well-designed carbon pricing mechanisms can achieve significant emissions reductions. For instance, Sweden's carbon tax, introduced in 1991 and currently over \$130/ton CO_2 , has helped reduce emissions by over 25% while sustaining economic growth (Andersson, 2019). Similarly, British Columbia's carbon tax led to a 5–15% drop in per capita fuel consumption between 2008 and 2015 (Murray & Rivers, 2015).

However, not all implementations have been equally successful. The EU Emissions Trading System (ETS), while the largest globally, has faced volatility in permit prices and

issues of overallocation in its early phases (Ellerman et al., 2010; Burtraw & Szambelan, 2019). These experiences highlight the importance of robust institutional frameworks, transparent governance, and regular policy adjustment in ensuring the effectiveness of carbon pricing.

Revenue Recycling and Economic Impacts

A central debate in the literature is how to use the revenues generated from environmental taxation. Goulder and Hafstead (2018) argue that revenue recycling—using tax revenues to lower other distortionary taxes or to fund public investments—can offset economic burdens and generate a "double dividend." Studies suggest that if revenues are directed toward reducing income taxes or subsidizing clean technologies, environmental taxes can be both growth-neutral and equity-enhancing (Fullerton & Metcalf, 2001; IMF, 2019).

On the other hand, poorly managed revenue recycling can undermine both political and environmental objectives. For example, some countries have diverted green tax revenues into general budgets without earmarking them for environmental or equity goals, leading to public distrust (Baranzini et al., 2017). Therefore, transparency and participatory budgeting are seen as critical components in building long-term public support for environmental tax reforms.

Equity and Distributional Effects

One of the major criticisms of environmental taxation is its regressivity, i.e., the disproportionate burden on lower-income households. Several studies have modeled household expenditure and found that carbon taxes tend to consume a higher share of income among the poor (Bureau, 2011; Sterner, 2012). However, this effect can be mitigated through targeted cash transfers or subsidies to vulnerable populations.

For example, Klenert et al. (2018) compared various revenue-recycling schemes and concluded that lump-sum transfers tend to improve equity outcomes, particularly in low-income countries. In jurisdictions like Switzerland and Canada, a portion of carbon tax revenues are returned directly to citizens as "climate dividends," helping to cushion the social impacts while maintaining behavioral incentives. This aligns fiscal reform with broader goals of just transition and social inclusion.

Political Economy and Public Acceptability

Policy acceptance plays a decisive role in the success or failure of environmental tax reforms. Studies show that public opposition often stems from perceptions of unfairness and skepticism over government intentions (Carattini et al., 2017). Historical examples from Australia and France, where carbon tax proposals triggered public backlash, underscore the importance of political framing, communication, and stakeholder engagement.

Political economy literature emphasizes the need for credible commitment, interministerial coordination, and adaptive policymaking to manage transitional risks (Lockwood, 2015; Meckling et al., 2015). Building coalitions across ministries, civil society, and industry can enhance the legitimacy and sustainability of green fiscal policy reforms.

Policy Integration and Coherence

Isolated environmental taxes are often insufficient without broader integration into fiscal and industrial strategies. The OECD (2015) calls for policy coherence by aligning energy, transport, agriculture, and industrial policies with climate goals. Without coordination, conflicting subsidies or price signals can undermine the effectiveness of environmental taxes.

For instance, fossil fuel subsidies in many developing countries continue to distort markets despite the presence of carbon pricing mechanisms. According to IEA (2021), global fossil fuel subsidies totaled over $440 billion in 2021, offsetting many of the intended effects of green fiscal measures. This contradiction suggests the importance of comprehensive reform packages that address both positive and negative incentives in the economy.

Gaps in Developing Country Literature

Much of the existing research on environmental taxation is concentrated in high-income countries. There is limited empirical evidence from low- and middle-income nations, where institutional capacity, informal sectors, and energy access present unique challenges (UNEP, 2018). Yet these countries are also the most vulnerable to climate change and often stand to gain the most from sustainable growth pathways.

Emerging studies suggest that tailored green tax designs, such as differentiated pricing or hybrid instruments, may be more appropriate in such settings (Whitley et al., 2016). Moreover, international financial support and capacity-building are necessary to enable the effective adoption of environmental fiscal instruments in these contexts.

RESEARCH METHOD

Research Design

This study adopts the Systematic Literature Review (SLR) approach to synthesize empirical and theoretical research on the role of green fiscal policies—particularly environmental taxation—in promoting sustainable economic growth. SLR is a structured and replicable method for collecting, evaluating, and interpreting existing research relevant to a clearly defined research question (Tranfield et al., 2003). The primary research questions guiding this review are:

- What types of environmental taxes have been most effective in reducing emissions?
- How have these taxes contributed to sustainable economic outcomes?
- What are the challenges in the implementation of green fiscal instruments across different countries?

Table 1. Table Of Reviewed Articles

Author(s), Year	Country/Region	Policy Instrument	Study Type	Key Findings	Equity/Distributional Considerations
Barbier (2016)	Global	Environmental taxation	Theoretical	Supports inclusive growth; promotes sustainable agriculture and energy	Reduces inequality when subsidies are targeted
Bowen & Hepburn (2014)	UK/EU	Carbon tax & ETS	Theoretical/Modeling	Carbon pricing reduces emissions efficiently	Needs global coordination to avoid carbon leakage
Jacobs (2013)	EU	Policy discourse	Qualitative	Framing affects adoption of green policy	Policy communication influences equity outcomes
Loiseau et al. (2016)	Global	Conceptual frameworks	Theoretical	Lack of consensus in green economy definitions	Calls for balanced frameworks considering equity
McKinsey & Co. (2020)	Global	Green stimulus spending	Empirical/Modeling	Green recovery drives long-term returns	Supports low-income groups through jobs
OECD	OECD countries	Cross-sectoral	Empirical/Policy	Policy	Supports multilevel

Author(s), Year	Country/Region	Policy Instrument	Study Type	Key Findings	Equity/Distributional Considerations
(2015)		tax alignment	report	fragmentation weakens carbon pricing	coordination for equity
Rydge et al. (2018)	UK	Industrial green policy	Empirical	Green R&D and industrial innovation aid transition	Public-private partnerships ensure inclusivity
UNDP (2021)	Developing countries	Green bonds & climate funds	Empirical	Mobilizes funds for green infrastructure	Equity challenges in access to finance
Yeo & Chang (2017)	Asia	Renewable energy subsidies	Comparative	Policy outcomes vary by political context	Need for regional equity mechanisms
Zhang & Liu (2020)	China	Cap-and-trade system	Empirical	20% emissions reduction observed	Regional design flexibility helps equity
Klenert et al. (2018)	Various	Carbon tax + cash transfers	Theoretical/Modeling	Lump-sum transfers improve acceptability	Enhances equity and reduces regressivity
Carl & Fedor (2016)	Sweden	Carbon tax	Empirical	Significant emissions drop without economic harm	Revenue used to reduce labor tax burden
Goulder & Hafstead (2018)	USA	Revenue recycling	Modeling	Recycling can yield double dividend	Tax-shifting protects low-income households
Carattini et al. (2017)	Multiple	Public perception of carbon taxes	Empirical	Opposition driven by fairness concerns	Public trust essential for policy equity
Fullerton & Metcalf (2001)	USA	Green tax reforms	Theoretical	Design affects efficiency and equity	Proper targeting mitigates regressivity

RESULT AND DISCUSSION

Effectiveness of Environmental Tax Instruments on Emission Reduction

Out of the 15 reviewed articles, nine studies directly assess the impact of environmental tax instruments such as carbon taxes and emissions trading systems (ETS) on emission reduction. For example, Zhang & Liu (2020) reported that the ETS in China achieved a 20% reduction in emissions during its initial implementation phase. Similarly, Carl & Fedor (2016) highlighted that Sweden's carbon tax—set at over USD 130 per ton of CO_2 —led to substantial emission reductions without harming economic growth.

These findings indicate that market-based fiscal instruments can be highly effective in curbing greenhouse gas emissions, provided they are appropriately designed and implemented within a supportive institutional context. Ellerman et al. (2010) also noted

that misaligned allocation mechanisms within the EU ETS led to price volatility that weakened carbon pricing effectiveness.

In general, the effectiveness of green fiscal tools is significantly influenced by policy design, implementation consistency, and institutional capacity. Countries with strong regulatory frameworks and transparent governance tend to show better environmental outcomes.

Economic Impacts and Inclusive Growth

Many of the reviewed articles emphasize that green fiscal policies not only achieve environmental goals but also have substantial economic implications. For example, McKinsey & Co. (2020) found that green stimulus investments in the post-COVID-19 recovery produced higher long-term returns than traditional stimulus scenarios.

Studies by Goulder & Hafstead (2018) and Fullerton & Metcalf (2001) underscore the benefits of revenue recycling—using revenues from carbon taxes to reduce income taxes or fund public programs—which can result in a double dividend: environmental and economic benefits simultaneously. In this way, fiscal instruments are not just tools for mitigation but also catalysts for equitable and sustainable economic growth.

These insights reinforce the narrative that well-designed carbon taxes, combined with strategic public investment and incentive structures, can contribute meaningfully to long-term development objectives while ensuring fairness and broad-based prosperity.

Equity and Distributional Considerations

Ten of the fifteen studies explicitly discuss distributional justice and social equity issues related to environmental tax reforms. For instance, Klenert et al. (2018) and Carattini et al. (2017) found that carbon taxes are often perceived as regressive, disproportionately affecting low-income households.

To mitigate this, some countries have implemented lump-sum transfers or carbon dividends, redistributing revenues directly to citizens in cash. This approach has been shown to enhance public acceptance and reduce resistance, as evidenced in case studies from Canada and Switzerland.

These findings highlight the critical need for equity-sensitive policy design, in which redistributive mechanisms are embedded in the fiscal transition framework. Moreover,

strong public communication strategies and stakeholder engagement are essential to fostering social legitimacy and support for green fiscal reform.

Implementation Challenges and Policy Coherence

OECD (2015) and Loiseau et al. (2016) stress the importance of cross-sectoral coherence in the implementation of green fiscal policies. Fragmented approaches across energy, transport, and agriculture sectors often reduce the effectiveness of fiscal interventions. For example, continued fossil fuel subsidies in many developing countries directly undermine the objectives of carbon pricing mechanisms.

UNDP (2021) further points out that in developing contexts, limited access to green finance and weak institutional capacity exacerbate disparities in implementing low-carbon transitions. Meanwhile, Yeo & Chang (2017) argue that in Asia, political stability and national institutional capacity are critical for successful environmental policy implementation.

In summary, green fiscal reform must be approached holistically, addressing institutional, economic, and social dimensions. This includes phasing out harmful subsidies, aligning fiscal strategies with national development plans, and building technical and governance capacity at all levels of government.

CONCLUSION

This systematic literature review has examined the role of green fiscal policy—particularly environmental taxation—as a key instrument in addressing climate change while promoting sustainable and inclusive economic growth. The review of 15 scholarly and institutional sources revealed that carbon taxes, emissions trading systems (ETS), and green public spending can significantly reduce greenhouse gas emissions, provided they are embedded in coherent and well-designed policy frameworks.

The findings indicate that carbon pricing mechanisms are most effective when paired with revenue recycling schemes that mitigate distributional impacts and enhance public support. Countries like Sweden, China, and Canada demonstrate that market-based fiscal tools can achieve environmental goals without undermining economic stability, especially when backed by strong institutions, transparency, and public engagement. However, political resistance, perceptions of unfairness, and administrative complexity remain critical barriers to successful implementation.

Moreover, this review underscores the importance of integrating equity considerations and intersectoral coherence in the design of green fiscal policies. Without addressing social impacts and aligning fiscal strategies across energy, transport, and industry, climate-related interventions risk becoming fragmented and ineffective. Developing countries, in particular, face additional challenges due to limited financial resources and institutional constraints, highlighting the need for international support, capacity building, and context-sensitive policy design.

Policy Implications

1. Design with Equity in Mind: Carbon tax revenues should be redistributed through cash transfers or targeted subsidies to avoid regressive effects and enhance public acceptability.
2. Integrate Fiscal Policy Across Sectors: Governments must align green fiscal reforms with broader economic strategies, removing fossil fuel subsidies and ensuring coherence in energy, agriculture, and transport policies.
3. Strengthen Institutional Capacity: Effective implementation of green fiscal tools requires transparent governance, skilled bureaucracies, and mechanisms for monitoring, reporting, and enforcement.
4. Promote Public Dialogue: Sustained communication campaigns and stakeholder engagement can help build trust and counter resistance to climate-related fiscal reforms.
5. Support Developing Countries: International climate finance and knowledge-sharing mechanisms should be expanded to assist low-income nations in building green fiscal systems tailored to their socio-economic contexts.

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