



CLIMATE POLICY INTEGRATION IN INTERNATIONAL TRADE AGREEMENTS: A PATHWAY FOR INDIA'S SUSTAINABLE DEVELOPMENT

Abstract Climate policy integration into international trade agreements is pivotal for India's sustainable development. This research examines the challenges and opportunities in aligning trade frameworks with environmental policies. By analysing trade-environment linkages, policy mechanisms, and theoretical models, this study provides strategic recommendations for India to foster sustainable trade while maintaining economic growth. This study adopted an interpretivist philosophy with an inductive approach and explanatory design to examine the influence of climate policies on India's trade agreements. The secondary data were sourced from scholarly databases and analysed thematically. The findings revealed that climate policies significantly impacted trade reforms, sustainable development, and environmental regulation. The key themes included trade environment, climate policy effects on trade, and integration challenges of India. The study highlighted green finance, renewable energy, and digital innovations as significant sustainability drivers, observing financial gaps, regulatory inconsistencies, and ecological trade-offs. The overall summary of the study has reflected that the climate policy integrations are important for international trade, so that the sustainability initiatives are developed for ecological protection. The study has evaluated all the research questions and objectives based on which the effective result was developed. The recommendations were also established in the study for the implementation of values which are for the practical application in the country for better trade and climate relationships.

Research Through Innovation

Chapter 1: Introduction

1.1 Background

Climate change is a major global challenge, where international trade, a key driver of economic growth, is considered a contributor to environmental degradation. India's commitment to sustainable development is enshrined in its "Nationally Determined Contributions" or *NDCs*, which aim to limit global average temperature by 2⁰C (International Energy Agency, 2024). Moreover, the aim is to lower the emission intensity of the GDP by around 33-35% between 2025 and 2030 (International Energy Agency, 2024). Besides, India's trade agreements, such as those with the European Union and the UAE, traditionally focused on economic benefits and reduction of emission outputs (European Parliament, 2021).



Figure 1: Free Trade Agreement between the EU and its member countries

(Source: European Parliament, 2021)

India's commitment to climate sustainability and initiatives like the "National Action Plan on Climate Change" or *NAPCC* demonstrates its willingness to meet climate goals with the mission of "Perform, Achieve and Trade" or *PAT* (Press Information Bureau, 2021). Besides, India's participation in the *Paris Agreement* fosters its pledge to use renewable energy and achieve the goal of net zero by 2070 with an investment of \$160 billion (Silverstein, 2023). Therefore, India successfully adhered to climate considerations in its trade agreements without compromising economic benefits.

1.2 Rationale

The primary issue lies in the delayed integration of climate policies into trade agreements, where it aimed to pledge net zero by 2070 in COP26, whereas other countries aim at 2050 (BBC, 2021). Moreover, there is a disconnection between trade policies and environmental objectives. For instance, steel and aluminium exports to the US encounter 25% tariffs due to their higher emissions as per the 'carbon border adjustment mechanism' or CBAM (The Hindu, 2025). Besides, CBAM-covered goods of India, accounting for around 10% of the exported goods to the EU are equivalent to "\$106 per tonne of CO₂" (Centre for Science and Environment India, 2024). For this reason, an extra tax burden of 25% is imposed on Indian goods by the EU (Centre for Science and Environment India, 2024).

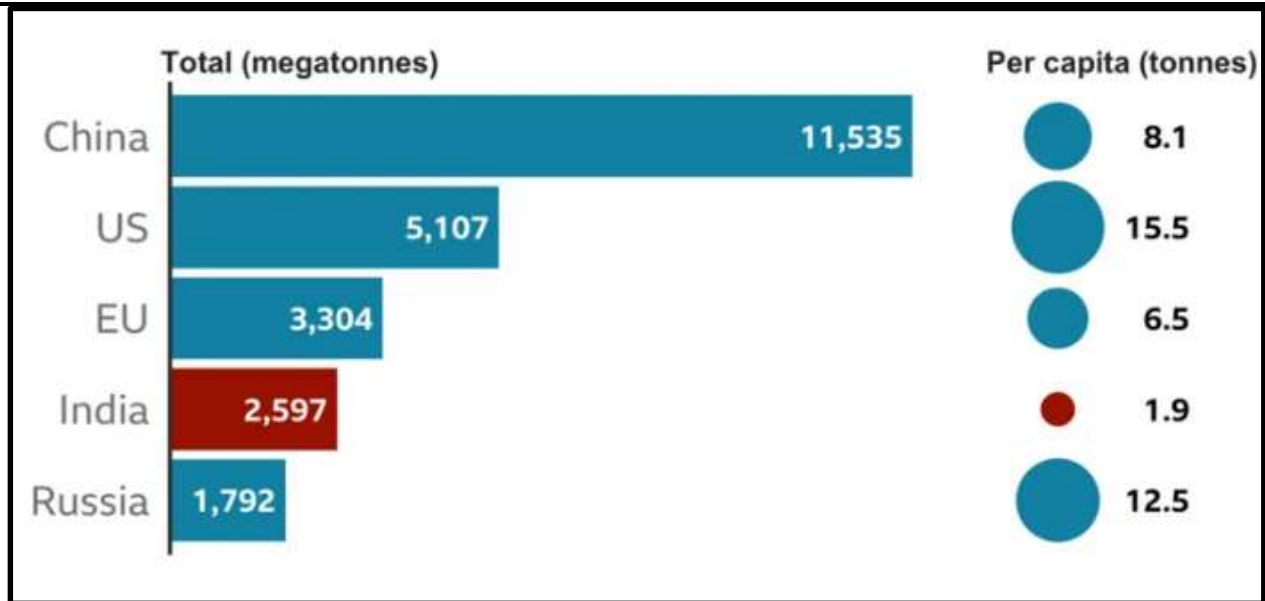


Figure 2: Total and per capita CO₂ emissions per year

(Source: BBC, 2021)

A misalignment between climate policies and trade puts significant pressure on the economic interests of India as the penalties from the CBAM can lower India's competitiveness. The CBAM approach, aimed to be implemented from January 1, 2026, poses ample risk to India's trade, as the EU accounts for 20.33% of the total merchandise exports of India, where 25.7% are already affected (The Hindu, 2024). Besides, the United Nations Sustainable Development Goals or SDGs implemented trade-related commitments and finance through its '*Addis Ababa Action Agenda*' (UN Trade & Development, 2025). This agenda recognises international trade as a pillar for economic growth and poverty reduction, where climate policies are included.

1.3 Aim

This research aims to explore how climate policies can be effectively integrated into India's international trade agreements to promote sustainable development. In addition, the study ensures that economic growth aligns with environmental sustainability.

1.4 Objectives

- To assess the current landscape of the trade environment in India.
- To evaluate the impact of climate policies on the trade agreements of India to promote sustainable development.
- To identify challenges and opportunities for integrating climate policies into India's trade frameworks.
- To propose strategic recommendations for India in trade policies to meet environmental sustainability goals.

1.5 Questions

- What is the current landscape of the trade environment in India?

- What is the impact of climate policies on the trade agreements of India to promote sustainable development?
- What are the challenges and opportunities for integrating climate policies into India's trade frameworks?
- Which recommendations can be provided to India in trade policies to meet environmental sustainability goals?

Chapter 2: Literature Review

2.1 Evaluation of the current landscape of the trade environment

In recent times, different countries have been involved in world trade to make a strong economy. According to Singh and Sen (2024), focused on trade, financial dynamics, and environmental sustainability, each sheds light on the preparedness of India for such integration. Singh and Sen (2024) mainly focused on the economic and regulatory landscape that reveals the progress of India in business reforms, yet lags in property rights and contract enforcement, key issues for trade policy. In this case, while China leads in regulatory efficiency, the performance of India in digital initiatives and infrastructure offers a pathway to green trade facilitation. However, the lack of a strong institutional correlation between India and China signals an inconsistent regional approach to climate-trade policy coherence. On the other hand, Ravi (2024) adds a financial dimension by analysing volatility in key assets like Bank Nifty, Bitcoin, and Ripple. His findings of bi-directional causality suggest that Indian financial markets are increasingly integrated with international digital asset trends. This implies that trade agreements incorporating carbon markets or green finance instruments could benefit from the financial adaptability of India. It is also necessary for robust mechanisms to manage inter-market shocks and volatility.

Similarly, Roy *et al.* (2022) emphasise the urgency of sustainability through land use through use reforms, smart agriculture and bioeconomy-based innovations. Their work highlights the environmental essentials that align with climate policies, with ecosystem restoration and biodiversity conservation. This ecological foundation is significant for developing trade agreements that include sustainability clauses mainly around agro-exports, land-use and carbon footprint monitoring.

2.2 Impact of climate policies on the trade agreements to promote sustainable development

The literature collectively underscores the urgent need for integrating climate policy within international trade agreements to foster sustainable development, particularly for emerging economies like India. Aswani *et al.* (2022) argue that trade-related agreements, especially those embedding climate cooperation, have been more effective in curbing emissions than climate treaties like the Paris Agreement, advocating for a fusion of trade and environmental policy. On the other hand, Su *et al.* (2021) present a more cautionary view, revealing that in BRICS nations, trade openness and technological advancement have largely intensified emissions, thus emphasising the environmental trade-offs of liberalisation. Their findings support a U-shaped Environmental Kuznets Curve, suggesting that growth alone is insufficient for emission reduction without stringent policy controls.

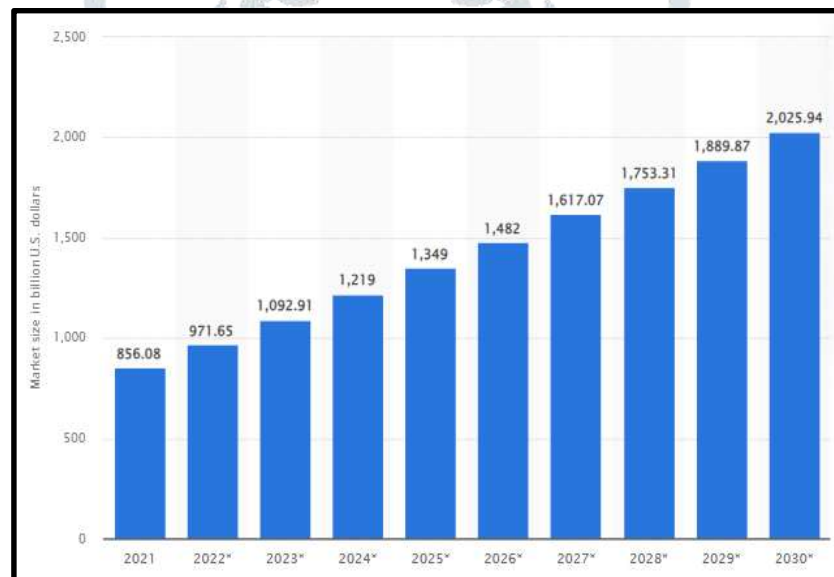
Similarly, Bhatnagar *et al.* (2022) highlight a national lens that mainly emphasises green finance and entrepreneurial innovation as significant levers for the ecological transition of India. In this case, while Aswani *et al.* (2022) call for

global policy alignment and Su *et al.* (2021) warn of trade-induced degradation, Bhatnagar *et al.* (2022) highlight grassroots financial mechanisms to green India's economy. These perspectives suggest that the path of India to sustainable development lies in integrating climate goals into trade policy while supporting domestic green finance and technological innovation. It is positioning India as a proactive international actor in climate negotiations, green innovation, and sustainable trade.

2.3 Challenges and Opportunities for Integrating Climate Policies

2.3.1 Challenges

One of the significant challenges is the economic impact of environmental measures imposed by trading partners. For instance, Kuman and Ohri (2024) claimed that the EU carbon tax policies are unfair and not acceptable as they only target developing economies. Although the negotiation between India and the EU is being continued at a 'technical level', EU officials said that India and South Africa opposed the CBAM (Kuman and Ohri, 2024). On the other hand, Dubash (2021) stated that India's inability and variety in climate governance and different climate policies are challenges to mitigate climate issues or emissions in a well-directed manner. Furthermore, Chateau *et al.* (2023) stated that integrating climate policies into trade frameworks poses economic risks, particularly for sectors reliant on fossil fuels. Henceforth, it can be stated that EU carbon tax policies, variations in climate governance policies in India and economic risks are the major barriers.



2.3.2 Opportunities

Figure 3: Renewable energy market forecast

(Source: Fernandez, 2024)

India's competitiveness can be enhanced by integrating climate policies into trade frameworks. India's competitiveness in green markets can be enhanced as the global demand for environmentally friendly products increases. The global renewable energy market is forecast to continue its upward growth, which can reach more than \$2 trillion by the end of 2030, where fossil fuels, rapid urbanisation and financial growth in emerging regions are considered major factors, leading to an enhancement (Fernandez, 2024). By investing in clean technologies and renewable energy, India can reduce its carbon footprint and improve the efficiency of its industries. On the other

hand, Mitra *et al.* (2022) opined that sustainable agriculture, solar power panels and advocating capacity-building initiatives can support industries in transitioning towards sustainable trade practices. Thus, India has a significant opportunity in terms of renewable energy and sustainable development in international trading.

2.4 Environmental Kuznets Curve or EKC

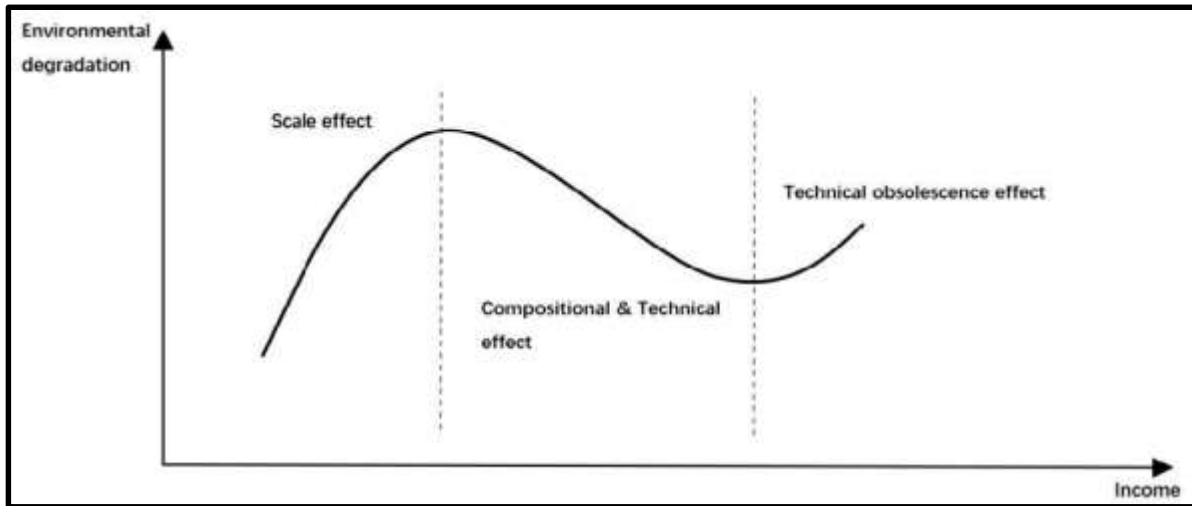


Figure 4: Environmental Kuznets Curve

(Source: Zhang, 2021)

The EKC hypothesis is that ecological deprivation primarily surges with fiscal progress and ultimately drops after a certain income level is touched. However, once a country reaches a certain income threshold, environmental conditions begin to improve as sustainable policies and cleaner technologies are adopted. For India, this model confers that as trade liberalisation boosts economic growth, environmental impacts may worsen unless climate policies are embedded into trade agreements. Thus, integrating effective climate policies, such as achieving sustainable development without significant ecological damage, needs to be incorporated into India's trade policy.

2.5 Literature gap

The existing literature mainly emphasises environmental sustainability, digital governance but lacks an integrated analysis of how digital bio-economy tools can be operationalised within international trade agreements to enhance environmental diplomacy and climate leadership. This study focused on mitigating this gap and provided strategic recommendations to effectively develop the trade environment.

Chapter 3: Methodology

3.1 Research philosophy, approach and design

A research philosophy refers to a foundational set of beliefs that shape how a research study is planned and carried out. In this research, the researcher utilised an '*interpretivism research philosophy*' (Ocaña-Fernández and Fuster-Guillén, 2021). The researcher used this philosophy to explore in which way climate policy in India's trade agreement is shaped by cultural values, perceptions. Apart from that, the researcher implemented an '*explanatory research design*' and an '*Inductive approach*' to conduct the research. The researcher used an explanatory research design to investigate the cause-and-effect relationships between climate policies and trade agreements of India.

3.2 Data collection and analysis

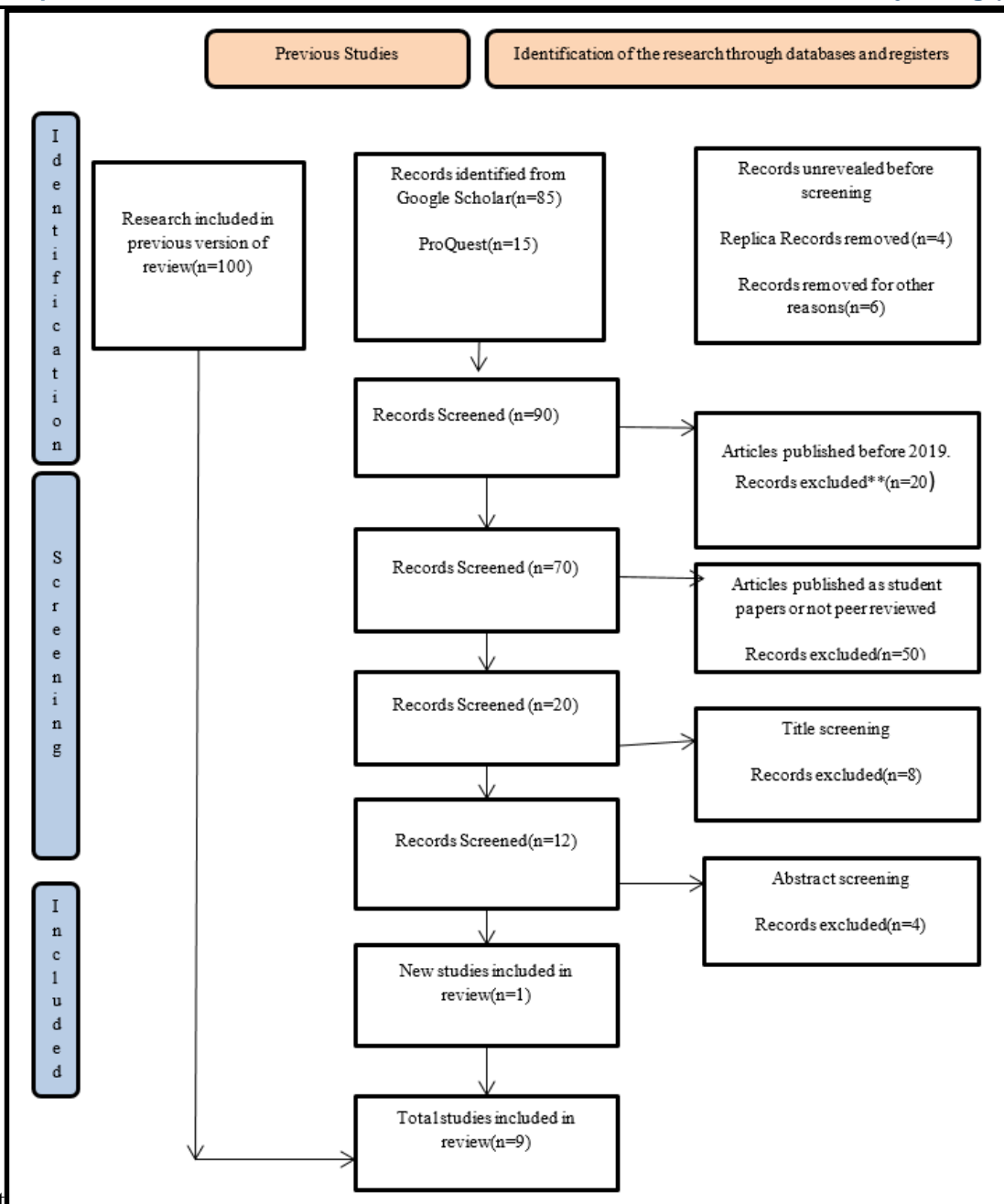
In this study, the researcher used a '*secondary data collection*' method. The researcher collected various papers from different databases such as 'Google Scholar', 'PubMed', and 'IEEE Xplore' (Firdaus *et al.* 2021). *Thematic analysis* was used to analyse the articles and helped to justify the aim and objectives.

3.3 Exclusion and inclusion

Criteria	Inclusion	Exclusion
Type of Sources	Different articles related to climate policies in India's trade	Unreliable sources, blogs
Dates of publication	Sources taken within the last five years (2020-2025) to maintain relevance	The articles were excluded which were published before 2019
Language	Only 'English papers' were utilised	Other 'non-English language' papers were excluded
Data relevance	Data was provided about implementing climate policy integration in the trade agreements of India.	Unrelated data, as well as insufficient information about the topic.

Table 1: Inclusion-Exclusion Criteria





(Source: Author) 3.4 PRISMA

Figure 5: PRISMA

(Source: Author)

3.5 Ethics

The researcher maintained all the necessary ethics in this secondary research. The researcher acknowledged the authors whose information was implemented in this research. The researcher securely saved all the confidential data with strong passwords, and after completing the research, all the data was removed (Ocaña-Fernández and Fuster-Guillén, 2021). The researcher did not misuse or manipulate any data in this study.

Chapter 4: Analysis and Discussion

4.1 Findings

4.1.1 Theme 1: Assessment of the current landscape of the trade environment in India

Authors	Findings
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Raihan <i>et al.</i> (2024)	The findings of the research have ensured the “environmental curve” followed by the pollution in countries like India. It has also confirmed that the implementation of “renewable energy usage”, followed by the “low-carbon economy” and “trade reforms”, is an important part of robust environmental policies that minimise the CO2 emissions and contribute to the development of the “green economy”.
Srivathsa <i>et al.</i> (2023)	The research has reflected the friction of the “priority areas” under India’s extended “protectionist network”. In the research, the “spatial congruence” of the “priority areas” with the “administrative units” was examined for economic development by the government of the country.
PRAKASH and SETHI (2021)	The research was conducted to investigate the gaps in finance, which is based on the “green projects” linked to the “planet-related SDG targets”. The paper reflected the “corporate fixed income”, “securities market” and “firming up the guidelines” for India’s “climate action plans” are inevitable before the “green bonds”.
Masand (2021)	The study highlighted that social media significantly influences consumer behaviour, supports small businesses, generates employment, and drives economic development. However, it raises concerns about privacy, misinformation.

Table 2: Findings of the trade environment in India

(Source: Author)

4.1.2 Theme 2: Evaluation of the impact of climate policies on the trade agreements of India to promote sustainable development

Authors	Findings
Bhatnagar <i>et al.</i> (2022)	The green project finance is the main aim of India for some years now, and important strategies were made for the “country’s financial sectors” to embrace “ecologically friendly methods”. It was stated in the paper that business activities are the “economy’s engine”, and the adoption of “sustainable business practices” is important for “carbon neutrality”.
Khan <i>et al.</i> (2022)	The findings of the paper directly stated about the “green finance” which reduces the “ecological footprint” and appears “environmentally friendly”. However, in the findings, it was also stated that the alternative measures and estimation strategies are an important part, and policymakers need to invest in climate finance for better productivity.
Balogh and Mizik (2023)	The paper has reflected that “economic progress” and the enhanced number of “free trade agreements” play an important part in “global climate mitigation” than that of the “Paris Agreement”. It was seen as to the results that most countries have rectified the agreement and implemented the pledges, but the implementation was lagging behind.

Table 3: Findings of the impact of climate policies on the trade agreements of India

(Source: Author)

4.1.3 Theme 3: Exploring the challenges and opportunities for integrating climate policies into India's trade frameworks

Authors	Findings
Thakkar (2021)	This article highlights that green marketing is essential for sustainable development, gaining momentum in India due to consumer environmental awareness. It offers both challenges and opportunities, and is expected to grow in relevance and demand.
Raihan <i>et al.</i> (2024)	The study highlights that agriculture and trade openness increase CO ₂ emissions, while renewable energy and economic growth slightly reduce them, supporting the “Environmental Kuznets Curve (EKC)” of India and the “pollution haven hypothesis”.

Table 4: Findings of challenges and opportunities for integrating climate policies

(Source: Author)

4.2 Discussions

The trade environment of India is a crucial landscape, and the first theme has assessed the current situation of the trade environment in India. In respect of the first theme, Raihan *et al.* (2024) stated that pollution in India is the most striking context, which has disrupted the trade environment of the country. The author has also said that the Indian economy is significantly driven by the agriculture and the trade sectors, which encourages the expansion of the marketplace. However, it was ensured from the paper that the utilisation of clean energy is important for the carbon dioxide emissions. However, it was reflected differently in the literature review, and Singh and Sen (2024) stated that the economic and regulatory landscapes reveal the progress of India but lack in property rights and contract enforcement. Masand (2021) underscores how social media fosters entrepreneurial growth, digital commerce, and employment generation significant to enhancing the trade competitiveness of India while exposing regulatory gaps in privacy and misinformation that require policy attention. On the other hand, in the theme by Raihan *et al.* (2024), it was reflected that renewable energy use is the most crucial part for the environmental trade, and the implementation of rooftop solar power will promote environmental sustainability. In this theme, the literature review and findings collectively highlight the pressure between economic growth and environmental sustainability. In findings, Thakkar (2021) and in the literature review, Mitra *et al.* (2022) highlight opportunities in green marketing and sustainable agriculture. On the other hand, in their findings, Raihan *et al.* (2024) affirm that agriculture and trade openness increase CO₂ emissions similarly to Dubash (2021) and Chateau *et al.* (2023), heavily focused on policy inconsistency and fossil-fuel dependence. This aligns with stressing the potential for renewable energy in trade integration.

In the theme it was also stated by Srivathsa *et al.* (2023) that the trade-offs which were stated in the study has reflected the regional peculiarities followed by the biodiversity conservations which could constrain the “provisioning services” like the “non-timber forest products” or the “livestock grazing” in the certain locations which would alter the hydrological services. However, in the literature, no such data was reflected, and in the literature by Ravi (2024), only the different financial dimensions were described, which were stated as the key

assets like the Bank Nifty, Bitcoin, and Ripple. Therefore, from the excavation of author, it was ensured that the green finance instruments could benefit from the financial adaptability of India. On the other hand, in the theme the PRAKASH and SETHI (2021) stated about the financial gaps of the green projects that pose challenges to India's SDG targets.

According to Bhatnagar *et al.* (2022), the insights regarding the impacts of climate policies on the trade agreements of India were established by which helps understand the different corners of the trade agreements which have influenced the environmental regulations. In the theme, it was stated by the author that the ecological friendly method is the most important in this situation, and the businesses were referred to as the economy engine for the development of the scenario. On the other hand, Khan *et al.* (2022) stated in the theme that green finance reduces the ecological footprint and promotes ecological friendliness.

However, in the literature, no such evidential proof was provided, and Aswani *et al.* (2022) argued that the trade-related agreements mainly for climate cooperation need more effective climate treaties like the Paris Agreement. In the literature, it was also stated by Bhatnagar *et al.* (2022) that the path of India to sustainable development lies in the integration of the climate goals, while supporting domestic green finance is instrumental. On the other hand, Balogh and Mizik (2023) in the theme have stated that free trade agreements are more important for global climate mitigation than the Paris Agreement.

Chapter 5: Conclusion

It was concluded from the research that the integration of climate policies into international trade agreements offers India a strategic pathway to balance economic growth with environmental sustainability. The research has resolved all the objectives and the research questions that were effectively integrated in every theme of the study. The secondary sources that were used were effective and showed that active participation in shaping the environmentally responsible trade agreements will not only strengthen India's international standing but will also contribute significantly to global climate action.

Chapter 6: Recommendations

From the overall excavation, it was ensured that India should prioritise the incorporation of environmental clauses in its bilateral and multilateral trade agreements to ensure the alignment with the global sustainability standards and its own climate commitments. This strategy would enhance India's participation in the green value chains and would attract eco-conscious investments. Moreover, India should strengthen its domestic policy by the harmonisation of its trade strategies to ensure that economic growth does not undermine ecological goals. For example, it was seen that the EU integrated the strict environmental standards in its Free Trade Agreements, like the EU-Japan, which has promoted sustainable development (Gilson, 2024). Similarly, India, with the development of the institutional capacity for environmental impact assessments in trade negotiations, will foster public-private partnerships for green innovation that will further support sustainable development.

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