

# Carbon Financing, Carbon Credits, and Global Climate Resilience Investments

Muhammad Awais Ishaque

<sup>1</sup>, Farid Ullah<sup>2</sup>, Manzoor Ahmad Afridi<sup>3</sup>

Shabidullah Wazir<sup>4</sup>

**KJPP**

**Citation:**

Ishaque, M. A., Ullah, F., & Afridi, M. A., Wazir, S. (2024). Finance Minister's committee on carbon financing, carbon credits, and global climate resilience investments. *Khyber Journal of Public Policy*, 3(4), winter

**Article Info:**

Received: 24/09/2024

Revised: 25/10/2024

Accepted: 01/11/2024


Published: 03/12/2024

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## Abstract:

The global economy is progressing towards a low-carbon future in response to climate change challenges. Countries are setting ambitious decarbonization targets, supported by United Nations-supervised funds to aid developing nations. This research paper outlines various funding sources available globally and examines mechanisms like carbon trading, addressing critical issues within these markets. It analyzes Pakistan's current regulatory framework and explores the potential for developing a carbon trading market. While voluntary carbon markets currently capture limited emissions, growth in carbon trading is expected in the next decade. Pakistan has significant potential for generating carbon credits, yet capacity challenges remain. This paper will identify essential steps to establish a robust carbon trading market in Pakistan, facilitating the country's transition towards a more sustainable economic model and improving its ability to mitigate climate change impacts effectively.

## Key words:

Low-carbon economy, decarbonization, funding sources, carbon trading, Pakistan

<sup>1</sup> Inland Revenue Service

<sup>2</sup> Election Commission of Pakistan

<sup>3</sup> Provincial Management Service-KP

<sup>4</sup> Information Group, Government of Pakistan

## *Introduction*

Climate change is the greatest long-term threat faced by the world today. In response, the global community and multilateral organizations have taken the lead in countering these threats. The United Nations Framework Convention on Climate Change (UNFCCC) is the leading organization spearheading initiatives to combat this issue. At the COP 21 in Paris in 2015, a legally binding agreement was signed by 196 parties; its overarching objective is to hold “the increase in the global average temperature to well below 2°C above pre-industrial levels” (United Nations, 2024). This objective envisions a reduction of GHG emissions by 43% by 2030 to arrest the devastating effects of climate change and to adapt to its impacts. The Paris Agreement reaffirms that developed countries should take the lead in providing financial assistance to less endowed and more vulnerable countries while, for the first time, encouraging voluntary contributions from other parties (ibid). It is estimated that a total of \$6 trillion is required to achieve the goals set for 2030; so far, only \$1 trillion has been directed toward these goals (CDPR, 2024).

The arena of climate finance is an emerging and integral part of this transformation of the global economy. As countries attempt to adhere to their Nationally Determined Contributions (NDCs), a host of transformative actions are required, meaning that requisite investments in mitigation and adaptation are key factors in their overall efforts. There are key areas of global finance directed toward these efforts, and countries working toward their NDCs can unlock financing from these sources. It is no surprise that Pakistan’s fragile and unresponsive governance system has failed to benefit from these climate finance sources. It is imperative that Pakistan prepares a robust, adaptive, and progressive whole-of-government approach to achieve its NDCs, as Pakistan is one of the most vulnerable countries to climate change. The citizens of Pakistan must also play their part in this monumental effort, as the country's viability is at stake.

## *Statement on the Problem*

Pakistan has been unable to secure significant climate funding from all sources. On one hand, the technical nature and prerequisites for international climate finance are difficult for Pakistan’s complex governance systems to exploit. On the other hand, the lack of capacity in the public sector to engage the private sector in exploiting potential funding sources is a major stumbling block. Therefore, carbon trading markets can offer much-needed investment in climate finance in Pakistan.

### *Scope of Study*

- The scope of this study is to examine existing international climate finance sources and the reasons for the low investment in climate-related projects in Pakistan.
- This paper will explore the regulatory framework in place at the federal and provincial levels designed to meet Pakistan's NDCs.
- Finally, this paper will outline a policy that will enable Pakistan to secure more climate finance and use it to adapt to climate change.

### *Research Methodology*

This paper will rely on secondary data extracted from reports by reliable organizations on the subject. Some academic papers on the topic have also been examined to build background knowledge. Various analyses, such as situational, institutional, comparative, stakeholder, and SWOT analyses, have been conducted on issues related to the topic.

### *Literature Review*

There is an emerging body of literature on the subject as the world increases its focus on climate change. In 2024, Transparency International outlined the critical issues in Pakistan related to climate finance. Weaknesses in public financial management have been identified, along with the need for capacity building to attract more climate finance. The report also traces the history of Pakistan's regulatory framework and the projects undertaken for mitigation and adaptation efforts. In another article from the Pakistan Institute of Development Economics, Zahid Majeed explained the opportunities for increasing climate finance in Pakistan. Additionally, a research paper by the Islamabad Policy Research Institute discussed the operationalization of a carbon market in Pakistan, identifying the challenges and prospects in this emerging field of climate finance.

### ***Background – Global Climate Finance Perspective***

Developed nations have formally agreed to jointly mobilize \$100 billion per year by 2020 from various sources to provide developing countries with funds needed for adaptation and mitigation measures (Green Climate Fund, 2023). However, this funding target has been met only once, in the year 2022-23. The flow of funds has been uneven, and there is no mechanism to enforce this commitment by developed nations (Butt, 2024).

The UNFCCC, considering the funding requirements for climate finance in the developing world, has developed certain mechanisms to push for reforms in global economies. The Clean Development Mechanism (CDM), introduced by the Kyoto Protocol, allows countries to earn certified emission reduction (CER) credits, each equal to one tonne of CO<sub>2</sub>. These credits are traded and can be used by developed nations to meet part of their emission reduction targets. The “Adaptation Fund” is financed by a 2% levy on CERs issued by the CDM. This mechanism stimulates sustainable development and emission reductions while providing developed nations with flexibility in meeting their emissions targets. The Adaptation Fund has reached \$1.1 billion and gives developing nations full ownership of adaptation projects (United Nations, 2024).

Recently, at COP 28, a landmark agreement on the Loss and Damage fund was reached, but it received pledges worth only \$700 million, which is 0.2 percent of the estimated funding needs (Butt, 2024). It is evident that the funding required for 2030 NDCs is not readily available, and developing countries must be creative to unlock more climate funding from the West.

Another source for developing countries to raise funds for climate-related efforts is the voluntary markets for carbon trading. In this model, companies, NGOs, governments, and individuals can buy and sell carbon offset credits. To capture one ton of CO<sub>2</sub> emissions, approximately 50 trees must be grown for one year. The size of the voluntary carbon markets reached almost \$2 billion by 2022 (Lawrence, 2022).

### ***Situational Analysis – Global Carbon Market Evolution***

The global carbon market is in flux, with major differences among international players regarding the investment needed and the role they can play in the transition to a low-carbon economy. Given the race to Net-Zero, their importance has significantly increased, as climate action requires more funding to avoid environmental destruction. Stakeholders can take steps such as boosting integration across markets and platforms, establishing globally uniform accreditation standards, and bolstering support market infrastructure to facilitate more efficient carbon trading (Martinez, 2023).

There are two types of carbon markets: compliance-driven and voluntary. There are currently 36 compliance carbon markets that offer cap-and-trade programs for heavy polluters, with an estimated size of approximately \$850 billion, catering to nearly 20% of GHG emissions (ibid). The voluntary carbon markets (VCMs) allow companies and governments to purchase credits, and their size has grown to \$2 billion as of 2022 (ibid). It is further estimated that the value of VCMs could reach \$1 trillion if the market structure improves by addressing concerns about the quality of carbon credits and placing more emphasis on removal technologies (ibid). Globally, removal credits are estimated to be more effective in reducing historical emissions and are priced at a premium compared to avoidance (or reduction) credits. Only 3% of the credits traded are removal credits (ibid).

Quality issues and oversupply of credits have led the market to struggle in recent years. As of 2023, the cumulative value of credits traded was roughly \$11 billion. The size of the voluntary carbon market reduced by 61% in 2023, with the value of traded carbon credits dropping to \$723 million from \$1.9 billion in 2022 (Greenfield, 2024). According to the World Bank, Pakistan has created a total of 21 million credits through all available mechanisms. In comparison, Bangladesh has created 43 million credits, and India has created 631 million credits as of the end of 2023 (World Bank, 2024). Total revenue raised from carbon trading mechanisms (voluntary and compliance) totals \$104 billion (ibid).

### ***Institutional Analysis – Pakistan Regulatory Framework Evolution and Carbon Credits Potential***

Pakistan has developed a regulatory framework aimed at addressing climate change challenges through carbon financing, carbon credits, and climate resilience investments. This framework encompasses various policies, strategies, and institutions that facilitate the implementation of climate-related projects and promote sustainable development (Butt, 2024). The acts are as follows:

<b>Jurisdiction</b>	<b>Legislative Framework</b>	<b>Year</b>
Federal	Pakistan Environment Protection Act	1997
Federal	Climate Change Act	2017
Punjab	Punjab Environmental Protection Act	2012
Khyber Pakhtunkhwa	KP Environmental Protection Act	2014
Sindh	Sindh Environmental Protection Act	2014
Baluchistan	Baluchistan Environmental Protection Act	2012

Pakistan's first Climate Change Policy was produced in 2012. The policy is accompanied by a framework for implementation (2014-2030), which details the mitigation and adaptation actions identified by the federal government. Following this overarching policy, the provinces have also developed Climate Change Action Plans, which are detailed as follows:

<b>Jurisdiction</b>	<b>Policy framework</b>	<b>Year</b>
Federal	National Climate Change Policy	2012 & 2021
	Framework of Implementation of CC Policy	2013
	National Adaptation Plan	2023
Punjab	(Draft) Punjab Climate Change Policy	2017
	(Draft) Provincial Climate Action Plan	2021
Gilgit Baltistan	GB Climate Change Strategy & Action Plan	2017
Azad Jammu & Kashmir	AJ&K Climate Change Policy	2017
Khyber Pakhtunkhwa	KP Climate Change Policy	2022
	KP Climate Change Action Plan	2022
Sindh	Sindh Climate Change Policy	2022
Baluchistan	(Draft) Baluchistan Climate Change Policy	Under development

According to Transparency International, grey areas in the realm of climate change governance have resulted in misaligned resource allocations, institutional dependencies, duplication of work, and opaque decision-making (ibid). The World Bank estimates that Pakistan needs \$348 billion during 2023-2030 for climate adaptation and mitigation (ibid). Overall, Pakistan's share of international finance is minuscule. The economic loss and damage of \$30.1 billion inflicted by the 2022 floods was more than the total disbursement from all UNFCCC (United Nations Framework Convention on Climate Change) funds since their inception: the Global Environment Facility (1991), Adaptation Fund (2001), and Green Climate Fund (2014) (Shaikh, 2024). According to some estimates, these funds have collectively disbursed about \$22 billion globally. Pakistan has accessed less than \$1 billion from all three funds in the last 30 years. Clearly, the gap between Pakistan's investment needs for resilience and low-carbon development cannot be met by the current climate finance ecosystem (ibid).

In the last two decades, the private sector has also successfully gained benefits through the UNFCCC Clean Development Mechanism. A total of 42 schemes are listed in the CDM registry, allowing them to earn certified emission reductions based on their carbon offsetting. However, due to the

price crash in 2012 and the absence of a climate finance framework, many businesses were unable to sell CERs (Butt, 2024). Independent experts on carbon trading estimate that Pakistan could generate between \$2 billion and \$5 billion by 2030 if the carbon market is developed (Hussain, 2024).

### ***Comparative Analysis – India and Pakistan***

According to World Bank data, Pakistan has issued a total of 21 million carbon credits, whereas India has produced 631 million credits. India has effectively engaged all its stakeholders to establish a green economy focused on solarization, afforestation, energy efficiency, and reducing coal use for power plants. India has utilized the Clean Development Mechanism (CDM) to actively participate in the carbon market; currently, India holds around 15% of the carbon credits issued globally and has earned \$1 billion to date. India has a robust procedure for identification, validation, emissions reduction verification, and issuance of credits that is not currently available in Pakistan. The carbon market in Pakistan is in a nascent stage, with growing awareness of the potential for carbon trading. Unfortunately, flagship projects like the Billion Tree Tsunami are not generating revenue due to the lack of a national strategy to align projects and investments with global markets. Pakistan's most successful project is the restoration of mangroves under the Sindh Delta Blue project, which has been able to earn some funds for the Sindh Government (Hussain, 2024).

### ***Stakeholder Analysis***

Addressing climate change requires a whole-of-government and whole-of-society approach to tackle the multifaceted challenges and transition to a low-carbon economy. The meaningful development of a robust carbon trading market will require all stakeholders to act in harmony to promote a new economy. The stakeholder analysis of the carbon trading market is as follows:

#### **Government, Policymakers, and Regulatory Agencies**

Work closely with industry leaders and peer agencies to create guidelines for generating high-quality credits and align monitoring and oversight protocols. The development of a centralized trading platform and robust registry to capture real-time information about the quality and age of credits is essential. Policymakers also need to publish strategic priorities and certification standards that will encourage the private sector to invest in these efforts.

## **Industry Groups, Climate Alliances, and Associations**

Draft voluntary standards regarding the use of credits in their transition plans, specifying how they fit into net-zero frameworks. Advocacy for robust exchanges and the introduction of new products and platforms is also essential. Furthermore, trading rules need to be developed to align incentives with greater transparency. Some proponents also suggest setting a minimum price for carbon credits.

## **Carbon Registries**

Carbon registries can improve confidence by enhancing transparency and developing quality standards. The data they hold should be accessible to market participants to provide clear information on pricing and the sale of credits. All registries should be linked to each other to create an international platform, as registries currently operate in isolation.

## **Buyers**

Buyers should first limit emissions across their business supply chains and then use carbon credits to account for residual emissions. Buyers should demand to purchase credits that are vetted by registries and have certifications to ensure better outcomes. The purchase of sub-standard credits would lead to misalignment with long-term goals.

## **Sellers and Project Developers**

Sellers should ensure legal and insurance buffers against risks such as bankruptcy and the reversal of sequestration through events like wildfires. They should also trade on public exchanges to reach a larger pool of participants and further establish credibility.

## **Financial Intermediaries (Exchanges, Brokers, Banks)**

Improving access to capital would be a significant step toward a low-carbon economy. Carbon markets need to work toward standards that provide a fair market price, facilitate long-term contracts, and reduce information asymmetry. New products and tools should be developed to ensure greater market participation and support early-stage climate investments. Greater efficiency in the trade of credits would signal to the market the prices and suitability of the credits available for trade.



## *SWOT Analysis – Ministry of Climate Change and Environmental Coordination*

### *Strengths*

1. Robust laws and a master plan for action exist in the form of NDCs.
2. Growing importance among policymakers and the public regarding climate change.
3. Provides critical input to the planning commission, which can create a robust framework for all climate-resilient investments.
4. Has led to the development of provincial laws for protecting the environment and adapting to climate change.
5. Can leverage innovative sources of funding such as debt swaps.

### *Weaknesses*

1. Implementation mechanisms are weak, as the Climate Change Authority and Climate Change Council are non-functional.
2. Priority areas for provincial government climate-resilient investments need to align with the federal government's vision.
3. The capacity to fully prepare Pakistan for climate change is lacking, as experts in finance, law, biodiversity, and the green economy are not available, leading to reliance on foreign consultants.
4. Has not capitalized on the available carbon trading mechanisms. If constructed with all relevant stakeholders, it has the potential to plant the seeds for sustainable climate-related investments across all sectors of the economy.

### *Opportunities*

1. Unlimited potential for renewable energy can provide guidelines and effective mechanisms for a low-carbon economy.
2. Can promote sustainable agriculture, livestock, land use, tourism, transport, and mining sectors.
3. Engage the private sector to invest in the green economy and earn carbon credits through a robust mechanism, requiring the development of a carbon trading regulatory authority and markets.
4. Utilize Pakistan's natural resources to create high-quality carbon credits that can equip Pakistan with the tools to secure its due share of climate finance.
5. By educating policymakers, citizens, and businesses about the threats of climate change, it can lay the foundation for a low-carbon green economy. This would also address the youth bulge that has become a burden on Pakistan.

### *Threats*

1. Political stability is essential for a long-term vision for a climate-resilient economy. Given Pakistan's history, this appears challenging, as national priorities are often held hostage to the national security paradigm.
2. Economic constraints have historically hampered Pakistan's development spending. Given recent trends in economic governance and political economy, it seems unlikely that the organization will successfully conduct its mission.
3. The geopolitics of climate is also crucial in Pakistan's context. Multilateral funding institutions have embedded climate action in their policies, making it expected that Pakistan will struggle to secure additional funding as climate action becomes a priority in many foreign development programs.
4. Population growth and rampant poverty indicate that Pakistan's current economic governance needs overhauling. Climate-resilient investments and a low-carbon economy will require increasingly more resources to tackle these issues. Unless the country can find innovative solutions to its development needs, existing problems and climate change could wreak havoc on the nation.

### *Issues and Challenges*

1. Pakistan needs substantial resources to prepare for climate change adaptation and mitigation. Our internal and foreign resources are insufficient to move the country forward. We need innovative approaches and new economic governance models to tackle this challenge.
2. Pakistan requires a grand strategy involving all levels of government to address climate change issues. This will necessitate the alignment of national, provincial, and local governments to work collaboratively toward priority areas.
3. There is a lack of expertise and technology available to engage global policymakers in our efforts to achieve a low-carbon economy.
4. Policy consistency is paramount for addressing the issues at hand. Pakistan needs better planning, and its implementation should be insulated from political stability concerns.
5. The absence of a carbon trading market and proper certification of carbon credits represents a significant capacity gap. Developing a carbon trading market can provide Pakistan with resources and open pathways to foreign investment for a low-carbon economy. The evolution of the global carbon trading market should also be considered while designing Pakistan's market.

## *Conclusion*

Pakistan holds immense potential for generating carbon credits due to its renewable energy resources and a growing emphasis on climate change adaptation. By developing a local carbon trading market in line with global market developments, Pakistan can earn significant revenues and signal the private sector toward low-carbon economic development. However, Pakistan's current economic governance is not very efficient in addressing the country's development needs, necessitating a significant overhaul to ensure that the priority areas identified by the NDCs are robustly tackled. This will also enhance Pakistan's image as a responsible nation globally and provide much-needed geopolitical space for further improvement. The time for climate-resilient investment is upon us, and unless we change course, Pakistan will be left at the mercy of climate change and its devastating effects. Carbon trading can provide some resources, but it will not be a panacea for our climate-related investments, as trading markets are competitive, and other countries may earn more due to the quality of their credits and their better image.

## *Recommendations*

1. Climate change institutions need to be operationalized and empowered (Climate Change Authority and Climate Change Council). Integration of federal, provincial, and local governance policies and actions with overarching priority areas for action is necessary.
2. Once established, the Climate Change Authority should outline guidelines and develop a robust, responsive carbon registry. A certification body for carbon credits also needs to be created, as foreign consultants and expertise are very expensive for the local market.
3. Development of a carbon trading market is essential to provide direction for local and foreign investors. The regulatory authority for carbon crediting should be developed at the federal level, as provincial governments may lack the resources to build the authority.
4. Engage with industry leaders, such as Japan (for carbon credit development), to identify best practices and transfer the latest technology for mitigation and adaptation projects. Japan has invested significantly in mitigation efforts in developing countries and shares the credits from these projects.
5. Pakistan needs to integrate transparency and a climate perspective in project design, planning, and budgeting to attract international climate finance.
6. Develop training programs for various stakeholders, including government officials, businesses, and the public, to encourage investment in low-carbon projects.
7. Pakistan should project a value-added perspective in its housing market. Over the next two decades, the country will create more than 2 million housing units. If developed in alignment with low-carbon principles, this sector will attract more climate-sensitive investment.

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