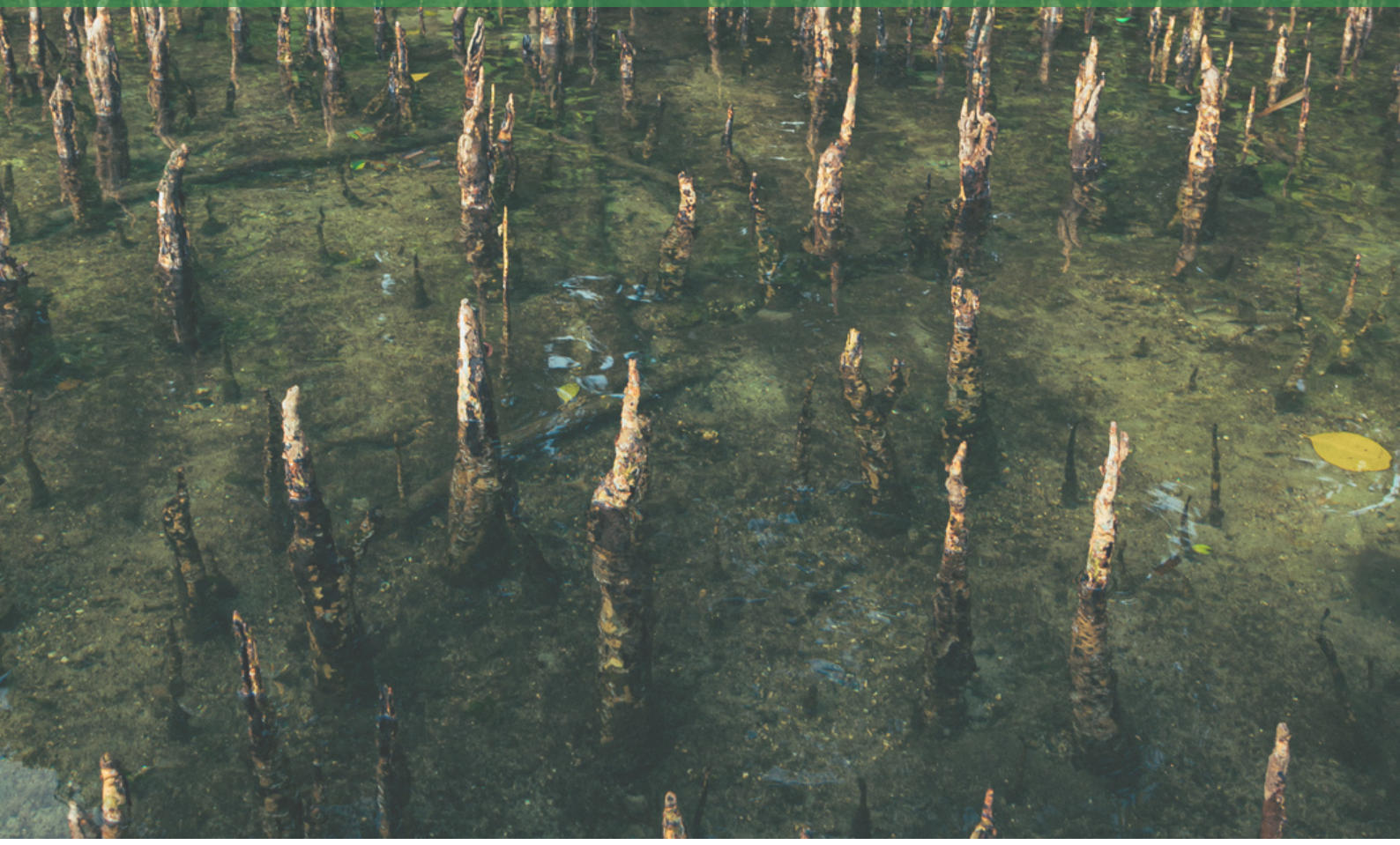
Carbon Markets Readiness in Pakistan Addressing Governance Gaps and Safeguarding Against Integrity Risks



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MESSAGE FROM THE CHAIRMAN

Pakistan is among the countries most severely affected by climate change, despite being one of the world's lowest contributors to global greenhouse gas (GHG) emissions, responsible for less than 0.8% of global emissions. While Pakistan has struggled to access appropriate amount of climate finance, the adoption of Policy Guidelines for Trading in Carbon Markets as a mechanism for financing low-carbon development is an important milestone in bridging our climate finance gap.

While Carbon markets can unlock substantial climate finance, strengthen our mitigation and adaptation efforts, and deliver co-benefits to communities across Pakistan. Its success depends on robust legal frameworks, clear baseline data, technical capacity, and equitable benefit-sharing mechanisms – all of which are essential to mobilizing the scale of finance needed for the low-carbon transition in Pakistan.

Transparency International Pakistan has endeavored to provide a comprehensive assessment of the governance landscape of carbon markets in Pakistan with an aim to provide actionable recommendations to build a credible, transparent, and inclusive carbon market ecosystem in Pakistan. TI Pakistan hopes that the key recommendations provided in the report will inform policymakers, practitioners, development partners, and civil society organizations working at the intersection of climate policy, finance, and governance in Pakistan.

Justice (R) Zia Perwez
Chairman
Transparency International Pakistan

MESSAGE FROM THE EXECUTIVE DIRECTOR

Pakistan's engagement on carbon markets has been shaped by early innovation as well as systemic challenges. From our initial participation in the Clean Development Mechanism (CDM) under Kyoto Protocol to landmark project level initiatives such as Delta Blue Carbon, our engagement—though fragmented at times—has demonstrated the technical feasibility and commercial viability of large-scale mitigation projects.

The latest launch of the Policy Guidelines for Trading in Carbon Markets in December 2024 and subsequent operationalization of carbon markets in Pakistan in early 2025 marks a critical shift from project level initiatives to a coordinated approach at federal and provincial level in line with Article 6 of the Paris Agreement. Transparency International Pakistan's report The Carbon Markets Readiness in Pakistan: Addressing Governance Gaps and Safeguarding Against Integrity Risks highlights that for Pakistan to lead in climate finance, it is imperative that our carbon market frameworks and implementation mechanisms include robust integrity, accountability, benefit-sharing and inclusivity measures in line with global best practices.

In doing so, the report highlights both the strengths of the current governance frameworks regulating carbon markets in Pakistan as well as provide key recommendations on the identified gaps. These include institutionalizing transparency and disclosure, oversight measures, clear grievance redressal mechanisms, and comprehensive framework on benefit sharing with communities and marginalised groups most affected by climate change.

Transparency International Pakistan has also proposed a Benefit Sharing and Inclusion framework as well as Carbon Market Development Checklist and policy recommendations, charting a practical pathway for Pakistan's transition to high-integrity carbon markets. Pakistan's leadership on carbon markets is clear from our landmark Delta Blue Carbon project, launched in 2015 as one of the world's largest blue carbon initiatives. However, to make our carbon markets a strategic tool for climate finance mobilization, we must place integrity and inclusion at the center of it.

Kashif Ali
Executive Director
Transparency International Pakistan

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We also recognize the valuable contributions of civil society, partner organizations, international organizations, government institutions, political parties, academia, journalists, business leaders, and professionals whose perspectives enriched the analysis and recommendations. Any omissions in this brief acknowledgement do not reflect a lack of gratitude; their collective support has been essential to shaping this report.

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ABOUT TRANSPARENCY INTERNATIONAL PAKISTAN

Transparency International Pakistan (TI Pakistan) is the National chapter of Transparency International, established in 2002 with the main aim of strengthening the global value system by making transparency and accountability more relevant public norms. Working in collaboration with other stakeholders and departments, TI Pakistan regularly publishes research papers, reform proposals, and manuals with the aim of disseminating information to all stakeholders, and also conducts capacity-building workshops.

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LIST OF ACRONYMS

AKF	Aga Khan Foundation
AEDB	Alternate Energy Development Board
BMWK	German Federal Ministry for Economic Affairs and Climate Action
CBTHP	Community-Based Trophy Hunting Programme
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
EU ETS	European Union - Emissions Trading Scheme
FGRM	Feedback & Grievance Redress Mechanism
FPIC	Free, Prior and Informed Consent
GB	Gilgit Baltistan
GDP	Gross Domestic Product
GGGI	Global Green Growth Institute
GHG	Greenhouse Gas
GLOF	Glacial Lake Outburst Flood
GMW	Global Mangrove Watch
ICVCM	Integrity Council for the Voluntary Carbon Market
IKI	International Climate Initiative
IPCC	Intergovernmental Panel on Climate Change
IPLC	Indigenous Peoples and Local Communities

ITMO	Internationally Transferred Mitigation Outcome
KBA	Key Biodiversity Areas
KP	Khyber Pakhtunkhwa
MoCC&EC	Ministry of Climate Change & Environmental Coordination
MoE	Ministry of Energy
MoF	Ministry of Finance
MoFA	Ministry of Foreign Affairs
MRV	Monitoring, Reporting, and Verification
NAP	National Adaptation Plan
NDA	National Designated Authority
NDC	Nationally Determined Contributions
OECM	Other Effective Area-Based Conservation Measures
PBS	Pakistan Bureau of Statistics
PES	Payments for Ecosystem Services
PFI	Pakistan Forest Institute
PNAC	Pakistan National Accreditation Council
PPIB	Private Power and Infrastructure Board
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SANAS	South African National Accreditation System
SDGs	Sustainable Development Goals
SECP	Securities and Exchange Commission of Pakistan
SPARC6	Supporting Preparedness for Article 6 Cooperation programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
VCMI	Voluntary Carbon Markets Integrity Initiative
VCS	Verified Carbon Standard
VCU	Verified Carbon Unit
VER	Verified Emission Reduction
WDPA	World Database of Protected Areas
WWF	World Wide Fund for Nature

INTRODUCTION

Background: Pakistan's Climate Woes and Extreme Vulnerability

Pakistan is among the countries most severely affected by climate change, despite being one of the world's lowest contributors to global greenhouse gas (GHG) emissions, responsible for less than 0.8% of global emissions. Yet, due to its geographical location, socio-economic structure, and fragile infrastructure, Pakistan faces a disproportionate share of climate-related impacts. The country's diverse ecological zones, from the melting glaciers of the north to the arid plains and coastal zones in the south, make it uniquely exposed to a wide array of climate hazards.

The Intergovernmental Panel on Climate Change (IPCC) has highlighted South Asia, and Pakistan in particular, as a climate hotspot. Over the past two decades, Pakistan has experienced an increase in the frequency, severity, and unpredictability of extreme weather events. According to the Germanwatch Global Climate Risk Index 2025, Pakistan ranks as the most climate vulnerable country in the world.[1]

Some of the most pressing climate risks include:

Climate Risk	Effect in Pakistan
Flooding	The monsoon floods of 2022 described as "climate carnage" by the UN Secretary-General, affected 33 million people, caused over 1,700 deaths, and displaced millions. The economic losses were estimated at over USD 30 billion, with damages to infrastructure, agriculture, housing, and livelihoods.[2]
Glacial Melt & GLOF	Pakistan houses more than 7,000 glaciers, the largest concentration outside the polar regions. Accelerated glacial melt has increased the risk of glacial lake outburst floods (GLOFs), threatening communities in Gilgit-Baltistan and Khyber Pakhtunkhwa.
Water scarcity	Pakistan is among the top 10 water-stressed countries.[3]Climate-induced shifts in precipitation patterns, combined with poor water governance, have exacerbated scarcity, affecting agriculture, hydropower, and drinking water supplies
Rising temperatures	In 2022, Jacobabad recorded one of the highest temperatures on Earth at 51°C.[4]Urban heatwaves are increasingly affecting major cities, placing stress on public health systems and labour productivity
Agricultural decline	With nearly 60% of the population dependent on agriculture, erratic rainfall, rising temperatures, and shifting seasons threaten food security and rural incomes.

1 https://www.dawn.com/news/1891272
2 https://press.un.org/en/2022/sgsm21519.doc.htm
3 https://www.dawn.com/news/1913435
4 https://www.businesstoday.in/latest/trends/story/hottest-city-on-earth-jacobabad-in-pakistan-hits-51-celsius-337603-2022-06-14

In mid-2025, Pakistan experienced a series of severe and overlapping flood events that underscored both the intensifying impacts of climate change and the fragility of national and local resilience systems. These events, ranging from high-intensity flash floods in the northern mountainous regions to urban and riverine inundations in the lowland plains, have resulted in widespread human, economic, and environmental losses.

The northern highlands, particularly in Khyber Pakhtunkhwa (KP) and Gilgit-Baltistan (GB), were severely affected by flash floods triggered by a combination of heavy pre-monsoon rainfall and accelerated glacial melt. Swat Valley witnessed some of the most acute impacts: sudden surges of water swept through riverine settlements, destroying bridges, damaging road networks, and claiming dozens of lives, including many children. In Gilgit-Baltistan, a glacial lake outburst flood (GLOF) disrupted the Karakoram Highway, a critical trade and connectivity route, further isolating affected communities. Localized landslides, such as the one in Danyor that buried volunteer repair crews, illustrate the compounding hazards that follow initial flood events.[5]

Similarly, urban centres in Punjab and KP, most notably Lahore, Rawalpindi, and Islamabad, experienced significant flooding due to sustained rainfall overwhelming inadequate drainage and stormwater management systems.[6] Informal settlements and low-income neighbourhoods, often situated in flood-prone areas, suffered disproportionately, with extensive property damage, loss of livelihoods, and heightened exposure to waterborne diseases. The urban flooding highlighted persistent gaps in infrastructure investment, zoning enforcement, and municipal preparedness.

Extended monsoon activity contributed to riverine flooding in Sindh and Balochistan, particularly Karachi.[7] The combined effects of upstream runoff and local rainfall increased the flood risk profile across the Indus Basin, underscoring the interconnected nature of Pakistan's hydrological vulnerabilities.

Rationale: The Urgent Need for Climate Finance in Pakistan

Pakistan's climate vulnerabilities are matched by its urgent and growing need for climate finance. As a developing country with ambitious climate goals, limited fiscal space, and significant investment gaps, Pakistan's ability to deliver on its climate commitments hinges on its success in mobilizing adequate, predictable, and accessible climate finance from domestic and international sources.

According to Pakistan's updated Nationally Determined Contributions (NDCs), submitted to the UNFCCC in 2021, the country intends to reduce its projected carbon emissions by 50% by 2030 relative to business-as-usual levels. Of this target, 35% is conditional upon international support, estimated to require over USD 101 billion by 2030. Yet, as of 2024, only a fraction of this requirement has been mobilized, primarily through concessional loans, multilateral climate funds, and bilateral assistance.[8]

The World Bank estimates that Pakistan will require approximately US $348 billion in total investment between 2023 and 2030 to mount a comprehensive response to its climate challenges—equivalent to about 10.7% of cumulative GDP over the same period. Of this amount, US $152 billion (44%) is allocated for adaptation and resilience measures, while US $196 billion (56%) is needed for decarbonization efforts.[9]

5 https://www.dawn.com/news/1930162
6 https://www.dawn.com/news/1925919/four-swept-away-in-islamabad-as-heavy-rain-triggers-flooding-in-nullahs
7 https://www.reuters.com/business/environment/pakistans-financial-capital-karachi-hit-by-torrential-rain-flooding-2025-08-20/
8 https://unfccc.int/sites/default/files/NDC/2022-06/Pakistan%20Updated%20NDC%202021.pdf
9 https://openknowledge.worldbank.org/entities/publication/614ddc2b-ca31-53c9-b59c-6bf12a56d336

Pakistan's mitigation financing goals are anchored in its ambitious target of reducing projected emissions by 50% by 2030. This pathway envisions 60% of the energy mix coming from renewable sources, achieving 30% electric vehicle penetration in new motor vehicle sales by 2030, and phasing out imported coal. On the adaptation front, national priorities include safeguarding the agricultural sector, which accounts for around 20% of GDP, as well as protecting natural capital (forests, water systems, coastal ecosystems, and air quality), strengthening urban resilience (urban areas contribute about 55% to GDP), and enhancing human capital through investments in health, education, and skills development[10]. A review of historical financing trends reveals a substantial gap between climate finance needs and actual flows. Over the past decade, Pakistan has secured an average of US $1.4–2.0 billion annually in climate-related financing[11], with a peak of approximately US $4 billion in 2021, still far below the required levels. The composition of climate finance in 2021 also highlights structural imbalances: public sources accounted for 69% compared to 31% from private sources, and international finance represented 84% of total flows compared to 16% from domestic sources.

Notably, domestic private climate finance stood at just 5%, significantly below the developing country average, underscoring the need to mobilize greater private-sector participation. Climate finance is vital for Pakistan across three pillars:

Pillar	Description	Finance Need
Climate Mitigation	To transition away from fossil fuels and reduce emissions, Pakistan must invest in renewable energy, energy efficiency, sustainable transportation, and low-carbon agriculture. Despite having over 60 GW of untapped solar and wind potential, clean energy uptake remains modest due to lack of investment and incentives.	USD 196 billion
Climate Adaptation	Pakistan needs substantial resources to build resilience in water management, agriculture, health, and disaster preparedness. Adaptation finance globally remains underfunded, only about 7–10% of tracked climate finance goes toward adaptation. For Pakistan, which faces significant adaptation costs (estimated at USD 7–14 billion annually), this gap is critical.	USD 152 billion
Loss and Damage	The 2022 floods brought global attention to the issue of irreversible climate losses in vulnerable countries. While the historic agreement at COP27 to establish a Loss and Damage Fund was a step forward, operationalization and access remain pending.	~ USD 40 billion[12]

The challenge is not unique to Pakistan. Globally, climate finance flows remain insufficient to meet the scale and urgency of the climate crisis. According to the Climate Policy Initiative's Global Landscape of Climate Finance 2023, total tracked climate finance reached around USD 1.3 trillion in 2021-2022, still far short of the USD 4.3 trillion needed annually by 2030 to meet global climate and development goals under the Paris Agreement. less than 25% of this finance flows to developing countries, and even less reaches highly vulnerable countries like Pakistan.[13]

10 https://unfccc.int/sites/default/files/resource/Finance_Gap_Update.pdf
11 https://transparency.org.pk/PUBLICATION/Financing-Climate-Action-Enhancing-Effectiveness-And-Transparency-In-Pakistan's-Climate-Governance-Frameworks.pdf
12 https://sdpi.org/assets/lib/uploads/Claiming%20Reparation%20for%20Loss%20and%20Damage%20Due%20to%20Floods%202022.pdf
13 https://www.climatepolicyinitiative.org/publication/global-landscape-of-climate-finance-2023/

CARBON MARKETS: A STRATEGIC TOOL FOR CLIMATE FINANCE MOBILIZATION

Photograph: Clean power generation at Duiker, Hunza. Source: Adobe Stock Photos.

Within the framework of the Paris Agreement, carbon markets, particularly those enabled under Article 6, offer a strategic mechanism to mobilize large-scale, results-based climate finance from both public and private sources. Article 6 establishes the legal and procedural architecture for countries to cooperate voluntarily in achieving their Nationally Determined Contributions (NDCs) through the cross-border exchange of mitigation outcomes.

By generating high-integrity carbon credits through rigorously designed and independently verified projects, countries and entities can access new finance streams, stimulate domestic climate action, and enable more ambitious climate targets.

Some of the key terms used in climate finance and carbon markets are defined in the following:

Carbon Credit

A tradable certificate representing one tonne of carbon dioxide equivalent (tCO_2e) reduced, avoided, or removed from the atmosphere, measured against a verified baseline.

Verified Emission Reduction (VER)

A carbon credit issued under a voluntary standard (e.g., Verra's Verified Carbon Standard, Gold Standard) following independent verification of emissions reductions or removals.

Internationally Transferred Mitigation Outcome (ITMO)

A unit of mitigation outcome transferred between Parties under Article 6.2 of the Paris Agreement, requiring corresponding adjustments to avoid double counting (UNFCCC, 2021).

High-Integrity Carbon Markets

Markets where credits are generated under robust methodologies that ensure additionality (emission reductions would not have occurred without the activity), permanence, rigorous monitoring, reporting, and verification (MRV), avoidance of double counting, and strong social and environmental safeguards. Alignment with global best practice frameworks—such as the

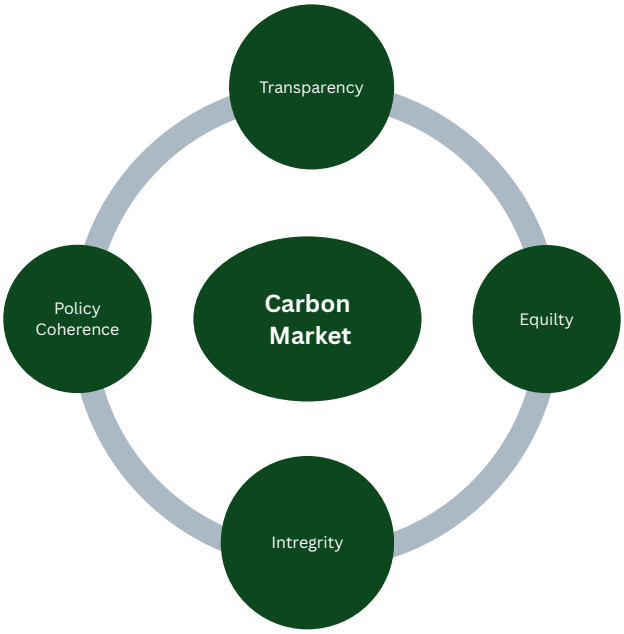
ICVCM Core Carbon Principles and the VCMI Claims Code—is essential for maintaining integrity.

Over the past decade, carbon markets have evolved from niche policy tools into a central pillar of the global climate finance architecture. The Paris Agreement established a universal framework for climate action and, through Article 6, enabled countries to cooperate in meeting their climate commitments through the exchange of verified mitigation outcomes. Since then, both compliance and voluntary carbon markets have expanded rapidly, reflecting growing demand for cost-effective pathways to achieve net-zero targets.

In 2023, the value of global compliance markets reached nearly USD 948 billion[14], driven by a combination of rising carbon prices, tighter emissions caps, and the expansion of trading schemes in major jurisdictions such as the European Union, China, and Canada. These markets now regulate a substantial share of global greenhouse gas emissions and provide clear price signals that incentivize low-carbon investment.

Parallel to this, the voluntary carbon market (VCM) has gained momentum as corporations, investors, and subnational actors seek to go beyond regulatory requirements. The VCM surpassed USD 2 billion in annual transactions in 2021, and forecasts suggest it could grow to between USD 50 and 100 billion annually by 2030, provided that concerns over quality and integrity are addressed. This growth reflects both rising climate ambition and an increasing recognition that market-based mechanisms can deliver finance to mitigation activities that might otherwise struggle to attract investment.

However, this global expansion has not been without challenges. Concerns over the quality of credits, the risk of double counting, and the adequacy of social and environmental safeguards have placed market integrity under intense scrutiny. In response, initiatives such as the Integrity Council for the Voluntary Carbon Market (ICVCM) and the Voluntary Carbon Markets Integrity Initiative (VCMI) have emerged to define and enforce high standards. These efforts aim to ensure that carbon markets not only reduce emissions but also deliver tangible co-benefits, protect human rights, and uphold environmental integrity.



The governance pillars for carbon markets, as highlighted by the UNFCCC

Against this backdrop, high-integrity carbon markets, grounded in transparency, robust monitoring, and equitable benefit-sharing, are increasingly viewed as essential to mobilizing the scale of finance needed for the global low-carbon transition.

14 https://www.reuters.com/markets/commodities/global-carbon-markets-value-hit-record-949-bln-last-year-lseg-2024-02-12/

CARBON MARKETS IN PAKISTAN

Pakistan's Early Engagement on Carbon Markets

Before the formal issuance of national carbon market guidelines, Pakistan's engagement with carbon trading mechanisms evolved in a somewhat fragmented but progressive manner, largely shaped by international climate frameworks and pioneering project-level initiatives.

In the early 2000s, Pakistan participated in the Clean Development Mechanism (CDM) under the Kyoto Protocol, registering projects primarily in the renewable energy, industrial efficiency, and waste management sectors. While several projects were successfully validated and generated Certified Emission Reductions (CERs), the overall scale remained limited due to low carbon prices in the post-2012 period, insufficient domestic institutional support, and the absence of a coordinated national strategy[15].

The Paris Agreement in 2015, and particularly Article 6, offered a new opportunity for Pakistan to re-engage in international carbon markets. However, in the absence of a national carbon market policy, early activity remained driven by private developers and international partnerships rather than a centralized governance framework.

One landmark example during this pre-guidelines phase was the Delta Blue Carbon project in Sindh, launched in 2015 as one of the world's largest blue carbon initiatives. Developed through a public-private partnership, the project aimed to restore and sustainably manage over 350,000 hectares of mangroves in the Indus Delta, generating Verified Carbon Units (VCUs) for sale on the voluntary market. Delta Blue Carbon demonstrated the technical feasibility and commercial viability of large-scale nature-based solutions in Pakistan, while also delivering significant co-benefits for biodiversity, fisheries, and local livelihoods. Importantly, it showcased how high-quality carbon projects could attract substantial foreign investment even in the absence of formal national guidance, though it also underscored the need for clear rules on benefit-sharing, authorization under Article 6, and integration with national climate targets. Later sections of this report will dive deeper into the Delta Blue Carbon project.

This early trajectory revealed both the potential and the gaps in Pakistan's approach. While innovative projects like Delta Blue Carbon proved market appetite, the lack of harmonized MRV systems, centralized registries, and institutional clarity limited the country's ability to systematically scale and regulate such initiatives. These experiences formed the backdrop against which Pakistan eventually moved toward developing and issuing its National Guidelines on Carbon Markets, seeking to formalize processes, safeguard integrity, and align with global best practices.

15 https://unfccc.int/files/na/application/pdf/03._saadullah_ayaz_cdm_presentation.pdf

PAKISTAN POLICY GUIDELINES FOR TRADING IN CARBON MARKETS

In December 2024, Pakistan took a significant step toward structuring its participation in global carbon markets by issuing its first National Guidelines on Carbon Markets. These guidelines represent the country's inaugural attempt to establish a coherent governance framework for both voluntary and compliance market activities, with a particular emphasis on aligning with the provisions of Article 6 of the Paris Agreement.

The guidelines serve multiple strategic purposes. First, they introduce a formal authorization process for carbon market activities, ensuring that projects intending to transfer mitigation outcomes abroad are consistent with Pakistan's Nationally Determined Contributions (NDCs) and sustainable development priorities. This includes provisions for Corresponding Adjustments—a requirement under Article 6 to prevent double-counting of emission reductions between host and acquiring countries.

Second, the guidelines outline roles and responsibilities across key institutions, particularly the Ministry of Climate Change & Environmental Coordination the Ministry of Climate Change & Environmental Coordination (MoCC&EC), which is designated as the national focal point for carbon markets. They establish procedures for project registration, monitoring, reporting, and verification (MRV), and propose the development of a national carbon registry to track units generated, transferred, and retired.

While the guidelines are an important milestone, they remain high-level and preliminary in nature. Much of the operational detail, such as the design of the national registry, methodologies for baseline setting, fee structures, and the mechanics of benefit-sharing—will require further elaboration through subsidiary regulations. Furthermore, institutional capacity, both at the federal and provincial levels, will need substantial strengthening to implement the guidelines effectively and maintain credibility in the eyes of international buyers.

Nonetheless, the issuance of the National Carbon Market Guidelines marks a critical transition for Pakistan: from ad hoc, project-led participation in carbon markets to a state-coordinated approach that aims to harness carbon finance as a strategic tool for climate action and sustainable development. If implemented with rigor, transparency, and adaptability, these guidelines could position Pakistan as a credible and competitive actor in the rapidly evolving global carbon economy.

Launch of Pakistan National Guidelines on Trading in Carbon Markets at COP29 in Baki, Azerbaijan.
Picture credits @ MOCC&EC LinkedIn handle

INSTITUTIONAL FRAMEWORK

Oversight of carbon market regulation and implementation rests primarily with the Ministry of Climate Change & Environmental Coordination (MoCC&EC), supported by its Climate Finance Wing, which includes a dedicated Carbon Market Section. This entity is responsible for policy development, administration of project approval procedures, and coordination with international partners on Article 6 cooperation.

The Private Power and Infrastructure Board (PPIB) plays a strategic role in facilitating project development, particularly renewable energy and CDM-based activities, which have historically generated emissions reductions eligible for carbon crediting, particularly the energy, industrial, agriculture, and waste management sectors, which are deemed as high emitters of carbon, and through these activities, can increase the potential to generate climate finance. Before the merger, this responsibility rested with the Alternate Energy Development Board (AEDB).

Emissions data and the nascent MRV infrastructure rely heavily on the Pakistan Bureau of Statistics (PBS), which continues to face challenges in providing consistent, granular greenhouse gas data required for emission baselines and long-term integrity of credits. The role of PBS has not been highlighted explicitly within any policy frameworks or documents.

While the federal-level institutional setup is steadily advancing, coordination with provincial environmental and planning departments remains essential as elements such as the local implementation, community rights, and benefit sharing would rest with them. Strengthening these multi-tier governance links is also a formal objective embedded within carbon market policy guidelines.

Institution	Role
Ministry of Climate Change & Environmental Coordination (MoCC&EC)	Policy development, administration of project approval procedures, and coordination with international partners on Article 6 cooperation.
Private Power and Infrastructure Board (PPIB)	Facilitating project development, particularly renewable energy and CDM-based activities
Pakistan Bureau of Statistics (PBS)	Data provision for emission baselines which will be imperative for MRV and long-term integrity of credits
Provincial departments	Local implementation, community rights, and benefit sharing

INTERNATIONAL LANDSCAPE AND PAKISTAN'S ENGAGEMENT ON CARBON MARKETS

Pakistan has actively engaged with international partners to align its domestic carbon market with global standards, receiving significant support from various organizations. These collaborations have been instrumental in shaping the country's carbon market infrastructure, focusing on areas such as authorization processes, monitoring, reporting, and verification (MRV) systems, and fee structures.

The key support for carbon markets in Pakistan has come from the Supporting Preparedness for Article 6 Cooperation (SPAR6C) program. SPAR6C is a five-year program funded by the German Federal Ministry for Economic Affairs and Climate Action (BMWK) through the International Climate Initiative (IKI). Implemented by the Global Green Growth Institute (GGGI) and the United Nations Environment Programme (UNEP) Copenhagen Climate Centre, SPAR6C has been pivotal in assisting Pakistan to establish a high-integrity carbon market. SPAR6C supported the launch of Pakistan's "Carbon Market Policy Guidelines" at COP29 in Baku, aiming to drive sustainable investments and strengthen global climate action.

The program has also provided technical support to the Lakhodair Landfill in Lahore, facilitating the development of a methane collection system as a pilot project for Article 6 compliance.

Similarly, the World Bank's PMI initiative aims to assist countries in designing and implementing carbon pricing instruments and developing market infrastructure. In Pakistan, PMI has focused on enabling activities for international carbon credit trading.

The PMI has supported the establishment of country-level carbon market infrastructure, including the operationalization of Article 6 of the Paris Agreement. In addition to that it has also provided technical assistance to align Pakistan's carbon market strategies with its Nationally Determined Contributions (NDCs).

Global Green Growth Institute (GGGI) has been instrumental in supporting Pakistan's transition to a low-carbon economy through its carbon pricing activities. The institute's efforts encompass various aspects of carbon market implementation. GGGI provided support across the full spectrum of carbon market implementation, from readiness under SPAR6C to facilitating bilateral cooperation through the Carbon Transaction Facility. The institute organized workshops to catalyze private sector engagement in carbon markets, integrating carbon finance into financial strategies.

Pilot Projects Driving Pakistan's Carbon Market

A critical step toward operationalizing Pakistan's carbon market has been the initiation of real-world pilot projects that test the newly approved guidelines, build institutional capacity, and generate carbon credits under international standards. Three notable initiatives, the Lakhodair landfill methane capture, the Sapphire Wind Farm, and the Delta Blue Carbon mangrove restoration project. These stand as pivotal test cases in governance, public-private collaboration, and MRV readiness.

The following table highlights the key approved projects in Pakistan, in addition to the three pilot cases discussed after.

Project	Description	Organization	Timeline
ATR Inc. Clean Water Project	• First Host Country Approval (Article 6.4) in Pakistan. • Installing 250 water filtration plants in Punjab (Lahore & Faisalabad) • Generates ~1.5M carbon credits.	ATR Inc., Punjab Saaf Pani Authority	Approval in 2024; Implementation 2026–2035
Mehmood Booti Dumpsite Rehabilitation	• LoI under Article 6.2/VCM. • Transforms 43-acre landfill into an urban forest and solar park • Generating ~930,474 carbon credits.	Ravi Urban Development Authority (RUDA)	LoI signed 2024; Credit period 2026–2040
Delta Blue Carbon (DBC-1 & DBC-2)	• Mangrove restoration in Sindh's Indus Delta. • DBC-1 (250k ha) already sold ~$40M in credits. • DBC-2 targets 200k ha for $12B revenue by 2075.	Sindh Forest Dept, Merlin's Wood, Indus Delta Capital	DBC-1 launched 2015; sales since ~2021; DBC-2 announced 2023, runs 2024–2075
NetZeroAg – Smallholder Rice Farming	• Voluntary offsets (Gold Standard). • ~1,500 basmati farmers; expanding to insetting schemes.	NetZeroAg	Registered 2022; current phase 2023–2026
Lakhodair Landfill Methane-to-Energy Pilot (SPAR6C)	• Pakistan's first government-to-government Article 6 pilot. • Methane capture from Lakhodair landfill to natural gas—carbon credits projected, multi-stakeholder benefit sharing.	SPAR6C, Punjab Govt, BMWK	Announced 21 Feb 2025; feasibility & prep through 2027
Feroze Power Carbon Credits Program	• Enables solar/wind users to monetize carbon credits (~7–10 tCO_2 per 10,000 kWh).	Feroze Power Limited	Active since 2023; ongoing
KP Forest Carbon Credit Mapping	• Mapping 2.2M ha to host 10 projects targeting 400M t CO_2, • Expected: $4B revenue, 50k jobs.	KP Govt, SEED Programme	Announced July 2025; mapping 2025–2026

Project	Description	Description	Timeline
KP Carbon Stock & Marketing Project	• Afforestation & conservation project could yield ~$140M/year. • Includes 10B Tree Drive benefits.	KP Forest Dept, Pakistan Forest Institute	2014–2026
Landhi Dairy Colony Waste-to-Energy	• Converts buffalo waste to energy & fertilizer. • Pakistan's 2nd carbon credit project.	NZAID, Empower Consultants	Early 2000s; CDM mid-2000s
Hawa Energy Wind Farm Project	• The first Pakistan project registered under Global Carbon Council. • 49.735 MW capacity, ~86k tCO_2/yr credits.	Hawa Energy (Pvt.) Ltd.	Commercial since 2018; GCC registration Jan 2025
Master Green Wind Power Project (Jamshoro)	• 50 MW wind power plant, projected ~96,895 tCO_2e/year reductions under GCC/CDM.	Master Green Energy Ltd.	Registered Apr 2025
Sapphire Wind Farm	• 52.8 MW wind farm delivering ~137 GWh per year, ~55k VERs annually. • Gold-standard offset	Sapphire Wind Power Co. Ltd.	Commissioned Nov 2015
PPIB ARE Carbon Credit Sharing Mechanism	• Proposal to share carbon credit revenues equally between ARE project sponsors and power purchasers.	PPIB & Ministry of Climate Change	Discussions ongoing; policy in drafting 2023

LAKHODAIR LANDFILL GAS RECOVERY PROJECT (LAHORE)

As Pakistan's first pilot project supported under Article 6 of the Paris Agreement, the Lakhodair landfill gas recovery initiative is a landmark test of the new governance architecture. Located in Lahore, the sprawling Lakhodair landfill processes over 5,500 tonnes of waste per day, of which 55–60% is biodegradable, making it a prime source of methane, a potent greenhouse gas.

Under the SPAR6C program, led by the Global Green Growth Institute and implemented by UNEP Copenhagen Climate Centre with donor support from the German Federal Ministry for Economic Affairs and Climate Action, Pakistan is piloting this project as its first government-to-government (G2G) carbon trade. In February 2025, the Punjab government formally accepted technical assistance, elevating the project as a national precedent for carbon transactions under Article 6.7.

The initiative involves capturing methane from decomposing organic waste and injecting it into Lahore's natural gas infrastructure, displacing conventional compressed natural gas (CNG) and reducing direct GHG emissions. The project also has benefit-sharing mechanisms: public sector revenues, private sector incentives, and community resilience enhancements, including job creation and public health impacts.

As a proof-of-concept, Lakhodair will contribute directly to Pakistan's NDC, covering roughly 5% of the national target, and serves as a testbed for the newly established emissions baselines, MRV protocols, corresponding adjustments, and provincial–federal coordination systems outlined in the policy guidelines.

SAPPHIRE WIND FARM (JHIMPIR, SINDHD

Operational since 2015, the Sapphire Wind Farm in Jhimpir is Pakistan's first CDM-registered renewable energy project and remains one of the most successful early examples of carbon credit generation. Over its lifetime, the project has reduced approximately 78,000 tCO_2e per year, accounting for nearly 364,000 CERs, including Gold Standard–verified reductions.

Sapphire's relevance to Pakistan's evolving carbon framework lies in its integration of renewable energy deployment and international MRV standards. While developed prior to the new guidelines, the project provides valuable lessons on aligning energy-based offset fungibility, baseline calculation, and long-term verification - all critical features now codified in Pakistan's policy.

Its success highlights the need for institutional bodies like the AEDB to engage early in MRV infrastructure development, support methodology alignment, and enable scale-up in similar sector-based crediting models.

DELTA BLUE CARBON

SINDH MANGROVE RESTORATION

The Delta Blue Carbon project in the Indus Delta exemplifies high-integrity, nature-based carbon crediting through jurisdictional mangrove restoration. Authorized in May 2024 by Pakistan's Economic Coordination Committee, the project is now formally permitted to issue credits internationally while applying corresponding adjustments, ensuring no double-counting with the country's NDC commitments.

Managed jointly by the Sindh Forest Department, Indus Delta Capital, Caelum Environmental Solutions, and Pollination, Delta Blue has already restored over 100,000 hectares of mangrove; by 2030, it aims to scale to 225,000 hectares, storing 142 million tonnes of CO_2 over its 60-year life cycle. The project has generated over $40 million in carbon credit revenues, with 40% allocated to the provincial government and the balance reinvested in community development, local resilience, and biodiversity co-benefits, demonstrating the practical operation of revenue-sharing and social safeguards mandated under Pakistan's carbon market policy.

Delta Blue's adherence to Verra's Blue Carbon methodology and its high-profile buyers, such as Microsoft and Carbon Growth Partners, highlight the potential for Pakistan to engage in high-integrity blue carbon credit markets, while navigating governance challenges around land tenure, monitoring, and legal clarity.

Photograph: Biodiversity restoration in Pakistan's mangrove forests - a potential co-benefit of nature-based carbon crediting (Source: Adobe Stock Photo)

POTENTIAL IMPACT

Pakistan holds substantial potential in carbon markets, offering both environmental and economic opportunities. With annual greenhouse gas emissions estimated at roughly 400–500 million tons of CO_2 equivalent, the country has a significant scope for mitigation across key sectors. If even 10–15% of these emissions were addressed through carbon projects, Pakistan could generate 40–75 million tons of tradable carbon credits per year. At current voluntary market prices of $10–30 per ton, this translates to a potential revenue stream of USD 400 million to USD 2.25 billion annually, which in itself is a pessimistic estimation.

The sectors with the greatest carbon market potential include energy, waste management, agriculture and livestock, forestry and land use, and industrial fuel switching. In energy, renewable projects like solar farms in Punjab and Sindh, wind projects in Jhimpir, and industrial energy efficiency initiatives could deliver significant emission reductions. Waste management offers opportunities through landfill and wastewater methane capture projects, exemplified by the Lakhodair landfill initiative in Lahore.

Agriculture and livestock could benefit from methane reduction projects, such as improved rice cultivation practices and better manure management, while forestry and land use projects, including mangrove restoration in Sindh and Himalayan reforestation in the north, can generate additional carbon credits. Industrial fuel switching, such as converting brick kilns and boilers from coal or oil to cleaner alternatives, adds another viable avenue. Together, these pilot projects represent tangible manifestations of Pakistan's carbon market policy in action. They validate the operational viability of MRV protocols, baseline methodologies, and project authorization procedures outlined in the federal guidelines. They also underscore the importance of institutional coordination, between MoCC&EC, AEDB, PBS, provincial agencies, and international partners in overseeing project compliance, data integrity, and benefit-sharing mechanisms.

Collectively, Lakhodair, Sapphire, and Delta Blue serve as living laboratories for Pakistan's carbon market. They bring clarity to the application of corresponding adjustments, illustrate the revenue-sharing models for intergovernmental cooperation, and provide early evidence of how high-integrity carbon credits can be generated while delivering co-benefits. As these pilots evolve into durable models, they will inform scaling strategies, governance refinements, and broader project pipelines aligned with Pakistan's climate and development objectives.

CORE GAPS IN CARBON MARKET GOVERNANCE IN PAKISTAN

As the preceding chapters outlined the foundational pillars of Pakistan's climate finance landscape, including the ambitions as outlined in the NDC, and the carbon market guidelines represent only the first step on a long and complex journey. While these guidelines, supplemented by the engagements around carbon markets, demonstrate a clear political will and set the ambitions to achieve the potential that carbon markets hold, they do not, in themselves, constitute the vehicle required to reach it. A critical disjuncture exists between the high-level aspiration to mitigate climate change, and the on-the-ground, functional architecture needed to operationalize sophisticated instruments like carbon markets in Pakistan.

Certain practical gaps currently prevent Pakistan from capitalizing on its mitigation potential and engaging credibly with international carbon markets under Article 6. The absence of a purpose-built governance architecture is the single most significant barrier to transforming Pakistan's carbon market potential from a theoretical concept into a tangible economic and environmental reality.

The analysis of these gaps is not an exercise in criticism, but a necessary diagnostic step - a candid assessment that is the sine qua non for developing the targeted, effective policy recommendations that will follow.

The chapter dissects these governance gaps across four interconnected domains, which collectively form the load-bearing columns of any functional carbon market. The analysis of gaps, as discussed earlier, has been done after reviewing existing literature, policy frameworks, international case studies, and verified through engagement with key stakeholders.

These core governance gaps in carbon markets in Pakistan are broadly explained in the table below:

Gap	Description
Legal and Regulatory Gaps	Examining the absence of a clear legal bedrock that defines carbon credits as assets, clarifies ownership rights, and provides a predictable basis for contracts and transactions.
Institutional Weaknesses	Assessing the fragmentation of responsibilities, lack of clear mandates, and insufficient technical capacity within government bodies to oversee, regulate, and manage complex market operations.
Technical Deficiencies	Highlighting the lack of essential market infrastructure, most notably standardized Measurement, Reporting, and Verification (MRV) systems and a national carbon registry to ensure the integrity and uniqueness of traded credits
Market Infrastructure and Private Sector Engagement	Investigating the barriers that inhibit the private sector's ability to develop projects, access finance, and participate actively in a domestic or international carbon market.

By systematically exploring each of these areas, this chapter will construct a comprehensive picture of the challenges that must be addressed to build a credible, efficient, and high-integrity carbon market in Pakistan.

1. Unavailability of robust data and an emissions baseline

Research through review of literature and engagement consistently underscored a cardinal concern: the quality, accessibility, and comprehensiveness of emissions data. A recurring theme that emerged throughout conversations with experts, government officials, and civil society actors was the foundational importance of robust data for the development of credible and effective carbon markets. In the absence of solid, verified data, the establishment of carbon markets becomes laden with uncertainty and vulnerability to manipulation, ultimately eroding trust in the system's integrity.

The lack of a clear, consolidated national emissions baseline has been highlighted as a significant barrier, through the course of engagement for this report. The institutions only possess fragmented and incomplete datasets on carbon emissions. Much of the existing information is derived from private sector actors, ad hoc studies, or project-level reporting, with little consistency in methodology, verification, or transparency. This severed emissions data situation creates a fundamental challenge: without a single, verifiable emissions baseline, it becomes nearly impossible to determine the starting point for any market-based climate action, let alone, development of carbon markets.

The implications of this gap are far-reaching. Without reliable data, questions arise around the integrity of carbon credits, the accuracy of reported emissions reductions, and the potential for double-counting.

Stakeholders, in the interviews, voiced concerns that this data vacuum threatens the legitimacy of emerging carbon markets, exposing them to reputational risks and diminishing their appeal to both domestic and international buyers. A poorly defined baseline undermines confidence, not only in the metrics being reported, but in the environmental outcomes these markets are meant to achieve. Hypothetically, a landfill installs a methane capture system and claims carbon credits for 50,000 tons of CO_2 reduction. Without reliable historical emissions data, it's unclear whether these reductions are truly additional, perhaps methane emissions were already declining due to earlier waste management improvements. At the same time, if another private company or local government also claims credits for the same landfill project, the same reductions could be counted twice. This scenario would not only inflate reported emission savings but also erode trust among international buyers and investors, who may question whether the credits represent real, verifiable climate benefits.

The absence of comprehensive emissions data undermines the entire market from its inception, from setting sectoral caps to verifying reductions and allocating allowances. This also leads to questions of additionality (whether emissions reductions would have happened anyway), double-counting, and overall market credibility. For example, if a renewable energy project receives carbon credits for displacing fossil fuels that were already planned to be phased out, the claimed reductions may not be truly "additional." Similarly, if multiple entities, claim the same emissions reductions from a single landfill methane capture project, this double-counting inflates the apparent impact, undermining trust in the market. Such scenarios directly affect market credibility, because investors, regulators, and international buyers need assurance that each carbon credit represents a real, unique, and verifiable reduction. In a nutshell, these processes hinge on knowing not only how much a country or sector emits today, but also on understanding

historical patterns, identifying high-emission activities, and forecasting business-as-usual trajectories.

Data plays an important role in addressing broader equity concerns. In the absence of disaggregated and transparent emissions information, certain sectors, regions, or communities may be unfairly penalized or excluded from market participation. A data-driven approach enables a more nuanced understanding of who is emitting what, where, and why - insights that are essential for designing fair and inclusive market mechanisms. Without such clarity, carbon pricing risks reinforcing existing inequalities rather than alleviating them.

Stakeholders also pointed out that credible data is not only essential for domestic market design but is a prerequisite for meaningful international engagement. As global markets increasingly link or interact through carbon credit exchanges, climate finance mechanisms, and compliance schemes, expectations for transparency and data integrity are rising. Countries without a well-established emissions inventory or baseline may find themselves unable to participate fully in global carbon trading frameworks or to attract climate finance under Article 6 of the Paris Agreement.

The issue, then, is not just technical, but also deeply institutional and political. The production, verification, and dissemination of emissions data depend on persistent coordination across government agencies, technical institutions, and private actors. It requires trust in the institutions responsible for collecting and reporting data, as well as clear rules around ownership, access, and use of data. In this sense, data is not just an input into carbon markets - it is a reflection of the governance systems executing the broader policies that carbon markets are a part of.

2. Siloed data and underutilization of existing data infrastructure

While the need for a robust and updated national emissions baseline has been widely acknowledged, the report also emphasizes on a critical but often overlooked opportunity: the presence of existing data systems and infrastructure that, if strategically utilized, can provide a strong foundation for Pakistan's carbon market ambitions. Rather than starting entirely from scratch, it shows a range of institutional knowledge, monitoring systems, and technical tools already in place - many of which remain fragmented, underutilized, or disconnected from broader national climate policy frameworks.

A recurring insight from consultations was that Pakistan is not starting from zero. Several data collection and monitoring systems have been developed over the past decade, often through donor-supported initiatives or sector-specific programs. For example, under the REDD+ (Reducing Emissions from Deforestation and Forest Degradation) initiative, Pakistan has invested in Measurement, Reporting, and Verification (MRV) systems to monitor changes in forest carbon stocks. These systems, although designed with forest-sector goals in mind, represent a significant step toward building national capacity for emissions tracking. However, in spite of presence of these systems, they are not being used, even for their primary purposes.

Similarly, institutions such as the Pakistan Forest Institute have developed detailed mapping standards and geospatial tools to monitor land use and forest cover. Provincial forest departments maintain forest inventory data and monitor deforestation trends at varying degrees of accuracy and frequency. In some provinces, such as Sindh and KP, tools have been piloted to engage communities in forest monitoring or to overlay emissions data with socio-economic vulnerability indicators. However, these efforts often remain siloed

disconnected from broader national carbon monitoring systems. These can be excellent resources for systems like the national carbon registry, promised under the carbon market guidelines.

This lack of interoperability was flagged as a major barrier to progress. Data is scattered across ministries, provinces, and agencies, often stored in incompatible formats or lacking the metadata and standards necessary for integration. The Ministry of Climate Change and Environmental Coordination (MoCC&EC), along with provincial authorities, holds valuable datasets, but the potential of these datasets to inform carbon market mechanisms remains untapped unless they are centralized, digitized, and governed under a unified national framework.

Simply put, there are some pieces of the puzzle available, but they're not connected. There's data on forests, on community vulnerabilities, even some historical emissions data generated by private actors. The challenge is not the complete absence of data, but the lack of a cohesive strategy to align, digitize, and implement it. Stakeholders emphasized that establishing this interoperability is not only about technology - it also involves institutional coordination and political will. Data sharing protocols, standardized formats, and secure digital platforms are all required to ensure that disparate sources of information can feed into a coherent national MRV system. Such systems must be transparent, verifiable, and aligned with international best practices to support both domestic carbon pricing mechanisms and participation in global markets.

3. Lack of technical capacity to govern carbon markets

A persistent and significant barrier is the widespread lack of technical capacity within Pakistan's institutions to design, implement, and manage carbon markets. While policy interest in market-based mechanisms is growing, the institutional readiness to operationalize such markets remains limited. This gap is particularly visible in government bodies such as the Ministry of Climate Change and Environmental Coordination (MoCC&EC), which also serves as the National Designated Authority (NDA) for operationalizing carbon markets in the country.

Stakeholders repeatedly emphasized that carbon markets are inherently complex and require a high level of technical sophistication. Unlike traditional policy instruments, they demand specialized expertise in multiple interrelated areas: emissions accounting, monitoring and verification protocols, legal frameworks for carbon ownership and crediting, and the design of market instruments such as registries, caps, and crediting methodologies.

Despite the presence of overarching policy frameworks, there are concerns about the practical, on-the-ground capacity to implement them. Across the board, there appears to be a mismatch between the expectations set by carbon market policies and the actual availability of trained personnel, institutional memory, and sectoral experience needed to realize those policies.

This lack of capacity is not only a question of number of people working on carbon markets. It also reflects the absence of sustained technical knowledge within public institutions. The design of carbon markets requires ongoing engagement with evolving global standards, technological advancements in emissions measurement, and shifting regulatory frameworks. Without a dedicated team at the Ministry, focused on these dynamics, institutional knowledge tends to be ad hoc, dependent on external consultants or

short-term projects, and not retained within government structures. This gap was particularly reflective through the initial design of fees, carbon credit pricing mechanisms, and benefit-sharing arrangements, especially with local communities, and the lack of engagement on this with any sectoral actors, shows the deficient capacity in Pakistan. The consequences are tangible: delays in program implementation, misalignment with international best practices, and reduced confidence among domestic and foreign stakeholders. This is relevant for all the involved ministries within this exercise, including, but not limited to the Ministry of Climate Change & Environmental Coordination, Ministry of Finance, Ministry of Foreign Affairs, and the provincial environment, forests, finance and industries departments.

The challenge is further compounded by the cross-cutting nature of carbon markets. Effective implementation requires coordination across diverse technical domains, forestry, energy, waste management, industry, as well as coherence between national and provincial agencies. However, many institutions are not yet equipped to manage this complexity. Coordination mechanisms are either informal or underdeveloped, and technical teams are often understaffed, with few personnel trained in carbon accounting or emissions modelling. The result is a fragmented institutional landscape where responsibilities are unclear, and accountability is diffuse.

In sum, stakeholder feedback reflects a shared understanding that Pakistan's institutional ecosystem is currently underprepared to meet the technical demands of carbon market development. While there is growing recognition of the importance of markets as a climate policy tool, the lack of dedicated technical expertise within government and affiliated institutions poses a major obstacle for effective governance and operationalization.

4. Lack of inclusion and accountability

While carbon markets are often framed as an economic mechanism, they are ultimately implemented within real socio-political contexts. The processes surrounding their development and governance must reflect the interests and rights of the people and communities most affected by them. Even though within the guidelines and the rules, equitable benefit sharing is recognized as an objective of the carbon markets and it is also recognized as an outcome, with the Ministry (also the National Designated Authority for the carbon markets) responsible for being the primary proponent of the equitable benefit sharing arrangements, the mechanism remains notably underrepresented in the existing guidelines.

Specifically, the guidelines and the development process do not outline clear methods for identifying which communities or groups should benefit, nor do they define eligibility criteria for participation. There is no framework for community-level capacity building to ensure local actors can meaningfully engage in carbon projects or claim benefits. Moreover, the guidelines do not reference international standards on equity, social safeguards, or benefit-sharing frameworks, such as those promoted by the Green Climate Fund or the Climate, Community & Biodiversity Standards, leaving a gap in ensuring fairness, transparency, and inclusivity. In practice, this means that vulnerable or marginalized groups may be left out of decision-making processes, risk receiving fewer benefits than intended, or face inequitable impacts from projects implemented in their localities. Without formalized processes, the stated goal of equitable benefit sharing risks remaining aspirational rather than actionable.

Concerns around equity and fairness featured prominently in stakeholder feedback. Many participating stakeholders questioned whether the benefits of carbon markets, particularly the financial returns from carbon credit transactions, would be distributed equitably

among local stakeholders. This concern was especially salient in the context of local communities, who are often the direct stewards of forests, rangelands, and other carbon sinks. While these communities are essential to the long-term sustainability of carbon mitigation activities, there is limited evidence about their contribution to the development of carbon markets regime in Pakistan.

Carbon projects can bring significant money, but if communities don't see tangible benefits, you risk backlash, land conflicts, and ultimately, project failure. This point was echoed in several discussions, reinforcing the point that local ownership is not just a rubberstamping process, but essentially, a prerequisite for the success of any carbon market or offsetting initiative. Without mechanisms to ensure that benefits reach the ground level, the risk of opposition, project disruption, or even legal disputes increases significantly.

Despite several precedents of designing projects and policies through participatory approaches, the carbon market development in Pakistan appears to lack clear systems for ensuring accountability to affected communities. Interviewees expressed concern over the limited consultation with local stakeholders, civil society organizations, and even private sector actors during key phases of project planning and policy development . This lack of consultation leads to the point that the development process has largely been a top-down exercise, without an assessment of market readiness and needs. In some cases, there has even been reluctance to incorporate or utilize existing community-level data, such as vulnerability assessments or socio-economic profiles, which could otherwise be used to inform project design and ensure that interventions are responsive to local realities.

In summary, stakeholder feedback strongly suggests that the current development of carbon markets in Pakistan is constrained by insufficient attention to inclusivity and community rights. Without meaningful stakeholder engagement and accountable governance structures, carbon markets risk reproducing existing inequities rather than addressing them. Ensuring the participation and protection of local communities is not an optional add-on - it is central to the credibility, effectiveness, and long-term success of any carbon market initiative.

5. Lack of transparency

Transparency has emerged as one of the most pressing challenges in the development of carbon markets in Pakistan. Stakeholders across sectors have repeatedly emphasized that without clear and accessible information on how decisions are made, how benefits are allocated, and what safeguards exist for affected communities, trust in these mechanisms is likely to erode. While carbon markets are often framed primarily as economic instruments, they function within deeply social and political contexts. Their success, therefore, hinges not only on technical rigor but also on the perception of fairness, accountability, and inclusivity among those most affected.

This challenge is particularly pronounced in rural Pakistan, where land ownership and resource control are often concentrated in the hands of a few powerful families or local elites. Many communities in these areas have historically been marginalized in decisions concerning the use of natural resources, shaping long-standing patterns of exclusion. In such contexts, carbon projects that operate without transparent governance risk replicating these inequalities. Without mechanisms to clearly communicate project intentions, eligibility criteria, and processes for monitoring and reporting outcomes, local actors may feel sidelined or entirely bypassed.

The implications of opaque governance are far from hypothetical. Consider, for example, a reforestation initiative in the Himalayan

foothills. If the benefits, whether financial, technical, or capacity-building, are channelled exclusively through local elites, or if the criteria for participation are not publicly disclosed, marginalized households may see no advantage despite bearing potential impacts such as restricted access to land or labour demands. Similarly, in agriculture-based carbon projects, such as improved rice cultivation or livestock methane reduction initiatives, unclear benefit-sharing mechanisms could lead to disputes over land use or compensation, weakening community support for the project. In extreme cases, such exclusion could spark local conflicts or exacerbate social inequities, undermining both the credibility and environmental integrity of the carbon market itself.

This risk is compounded by the absence of formalized processes for community-level capacity building. Many guidelines for carbon market development in Pakistan recognize equitable benefit sharing as a stated objective but fail to provide actionable steps for identifying communities, training local actors, or aligning with international standards for social safeguards. Without targeted support, vulnerable groups may lack the technical knowledge or institutional access needed to participate meaningfully in project design, monitoring, or benefit distribution. Over time, this perpetuates cycles of exclusion and reinforces the perception that carbon markets primarily serve elite interests rather than delivering broad societal benefits. Transparency, therefore, is not merely a procedural concern; it is foundational to the legitimacy and sustainability of carbon markets.

Clear reporting standards, publicly accessible benefit-sharing frameworks, and robust channels for community participation are critical. They ensure that carbon projects are not only technically sound but also socially accountable. For example, publishing baseline emissions data, project MRV reports, and benefit allocation plans can empower local stakeholders to hold project developers accountable and verify that claimed reductions are real, additional, and uniquely attributable. In forestry or renewable energy projects, involving community representatives in monitoring activities can further build trust and ensure that benefits, such as training, employment, or revenue-sharing, reach intended recipients.

Ultimately, the success of Pakistan's carbon markets will depend on bridging this transparency gap. Markets that fail to demonstrate fairness, inclusivity, and accountability risk alienating the very communities whose cooperation is essential for environmental outcomes. By embedding transparency into every stage of carbon market design, from project selection and baseline verification to benefit distribution and ongoing monitoring, Pakistan can create mechanisms that are not only economically viable but also socially credible and environmentally effective. In doing so, carbon markets can evolve from abstract financial instruments into tools for inclusive climate action that strengthen both communities and ecosystems.

6. Clarity of roles

Even though the Ministry of Climate Change & Environmental Coordination is the National Designated Authority (NDA) and has taken the lead on coordinating the operationalization of the carbon markets, there is a deep and growing concern over the ambiguous governance structure surrounding carbon markets in Pakistan. One of the most significant challenges identified was the lack of clarity in delineating the roles and responsibilities of federal and provincial authorities particularly in light of the evolving perception that carbon is increasingly being treated as a provincial subject. This institutional uncertainty has the potential to generate jurisdictional conflicts that could seriously undermine the coherence, legitimacy, and implementation of a national carbon market framework.

At the heart of this concern is the unresolved

question of carbon ownership. Stakeholders pointed out that carbon, as a tradable asset derived from environmental services and land-based activities, does not sit neatly within existing administrative categories. Carbon falls into a grey area that could lead to disputes, post-18th Amendment. Without clear guidelines on who owns the carbon, who regulates the projects, and how revenues are shared, we risk jurisdictional battles that delay everything.

This grey area is particularly contentious following Pakistan's 18th Constitutional Amendment, which devolved a wide range of subjects, including environmental management, to the provincial level. The resulting governance structure has created overlapping mandates and inconsistencies across provinces. The dichotomy is that while the federal government is responsible for international climate commitments and carbon market coordination, provincial governments control key carbon assets such as forests, land use, and agricultural practices. This disconnect has led to questions around authority, accountability, and revenue entitlement, potentially leading to conflict.

The case of Khyber Pakhtunkhwa (KP) illustrates this tension intensely. KP holds approximately 45% of Pakistan's total forest cover, positioning it as a critical province in terms of carbon sequestration potential. Despite this, there is no workable solution that has been agreed between the provincial and federal administration on benefit-sharing which has sparked concerns about fairness and representation in carbon market planning, and raises broader questions about the economic incentives for provincial governments to support national-level carbon initiatives.

This also reflects the absence of a constitutional or legal framework that explicitly defines carbon as an asset and clarifies its governance. In the absence of such a framework, the risk of interprovincial disputes, whether over project approval, credit issuance, or benefit-sharing, remains high.

Carbon markets are inherently multi-sectoral and require coordination across various arms of government. Emissions reduction projects may span sectors such as energy, waste management, forestry, transportation, and industry, each of which may fall under the purview of different ministries. The complexity of this intersectoral engagement amplifies the risks posed by unclear mandates and weak institutional alignment.

The absence of a formal intra & intergovernmental coordination structure specific to carbon markets leaves a critical governance vacuum. Without a clearly defined mechanism to manage cross-sectoral and inter-provincial coordination, the risk of policy fragmentation is considerable. Competing interests, overlapping jurisdictions, and unclear lines of accountability can slow decision-making, complicate regulatory enforcement, and limit the scalability of market mechanisms.

7. Clarity of priorities

Review of literature and stakeholder interviews revealed deep concerns about the current direction of carbon market development in Pakistan, particularly the absence of a clear strategic vision. While carbon markets are fundamentally intended to drive emissions reductions and support climate goals, the prevailing narrative and institutional focus appear increasingly centred on raising external finance.

This shift in emphasis risks distorting the core purpose of carbon markets and undermining their environmental credibility.

Several interviewees observed that Pakistan's carbon market efforts are being framed more as a funding mechanism than as a climate mitigation tool. In the absence of a robust emissions baseline or sectoral abatement

strategies, it remains unclear how carbon market activities are expected to contribute to national targets under the Paris Agreement. Instead, project selection appears to prioritize revenue potential over climate impact, with limited evidence of alignment to a national decarbonization pathway.

This finance-orientation raises the risk of superficial or low-integrity projects being advanced primarily for credit generation. Stakeholders expressed concern that some initiatives, such as Mehmood Booti Dumpsite Rehabilitation Project, are being fast-tracked without transparent assessment of their additionality, long-term climate value, or alignment with community interests. Without rigorous standards, these projects may yield credits without delivering meaningful environmental gains.

This ambiguity undermines both domestic legitimacy and international confidence. A market perceived as focused on monetization, rather than emissions reductions, risks being viewed as a vehicle for greenwashing rather than genuine climate action. It also sidelines critical priorities such as equitable benefit-sharing, local community involvement, and environmental safeguards.

Ultimately, the lack of a coherent, climate-centred strategy has created confusion across institutions and stakeholders. Without a clear articulation of purpose, anchored in environmental integrity, Pakistan's carbon market risks becoming a transactional tool, rather than a transformative climate solution.
Ultimately, the lack of a coherent, climate-centred strategy has created confusion across institutions and stakeholders. Without a clear articulation of purpose, anchored in environmental integrity, Pakistan's carbon market risks becoming a transactional tool, rather than a transformative climate solution.

8. Paralysed market infrastructure and private sector engagement

The development of Pakistan's carbon market is increasingly constrained by the combined effect of legal, institutional, and technical gaps, with the private sector caught at the centre of this paralysis. Investors and project developers, who are critical to creating a pipeline of carbon projects, face an environment characterized by uncertainty, weak guidance, and unclear market rules. Without a stable regulatory framework, private companies hesitate to allocate capital, even for projects with strong environmental potential, as the risks of non-recognition, delayed approvals, or misaligned crediting remain high.

This situation reflects a classic "chicken and egg" problem. On one hand, private companies and financiers are unwilling to take early risks in a market where policy, legal, and procedural frameworks are not yet fully defined. On the other hand, a functional market cannot emerge without a sufficient supply of credible carbon projects. The result is a self-reinforcing cycle: the private sector waits for clarity and security, while the absence of project development continues to signal uncertainty to investors. Without intervention, this state of inertia limits both the growth of the carbon market and the private sector's role as a driver of innovation, capital mobilization, and climate action.

Several factors exacerbate this private sector paralysis. The legal framework for carbon markets remains fragmented, leaving businesses unsure about approval processes, eligibility criteria, and the enforceability of contracts. Institutional coordination is limited,meaning that project developers often face a maze of ministries and agencies, each with different procedures and priorities. This bureaucratic complexity increases transaction costs, slows timelines, and discourages new entrants from investing in carbon projects. Even firms with technical expertise are wary of committing resources when project approval and credit issuance remain unpredictable.

Technical gaps also contribute to private sector hesitancy. Investors and developers require robust measurement, reporting, and verification (MRV) standards to ensure that emissions reductions are credible, additional, and verifiable. In Pakistan, the absence of standardized MRV protocols, comprehensive baseline emissions data, and sector-specific methodologies leaves private actors exposed to uncertainty over whether their projects will generate marketable carbon credits. For example, a company seeking to develop a methane capture project or an afforestation initiative may face high upfront costs to establish baselines and implement monitoring systems, without any guarantee of recognized credit issuance.

Financial risks are further amplified by the lack of market mechanisms to incentivize early movers. Without risk-sharing instruments, credit pre-purchase agreements, or other financial guarantees, private investors perceive carbon projects as speculative ventures. Early movers bear disproportionate costs while the broader market remains underdeveloped, reinforcing reluctance across the private sector. The government's slow pace in providing clear regulations, streamlined procedures, and credible signals for market entry compounds this risk, leaving businesses with little motivation to take the first step.

Breaking this impasse requires targeted interventions that directly address private sector concerns. Clear and predictable legal frameworks, standardized MRV systems, and transparent project approval processes are essential to reduce perceived risk. Complementary financial mechanisms, such as blended finance instruments, credit guarantees, or public-private co-investment, can incentivize early movers, helping them to demonstrate viable business models while building a credible project pipeline. By addressing these structural and financial barriers, Pakistan can unlock private sector engagement, catalyse the creation of carbon projects, and establish a functional, credible carbon market.

In the absence of these measures, however, private sector actors will remain on the sidelines, and the market will continue to stagnate. The potential for carbon finance to drive both climate mitigation and sustainable development will remain unrealized, highlighting the urgency of creating a supportive environment where private companies can confidently invest, innovate, and lead Pakistan's transition to a low-carbon economy.

OPPORTUNITIES FOR PAKISTAN LEARNING FROM GLOBAL BEST PRACTICES

Learning from global experiences is vital for Pakistan as it develops its carbon markets and looks forward to developing a rigorous governance mechanism around them. This chapter examines four case studies from Ghana, South Africa, California, and Brazil, each offering important lessons on building credible, transparent, and equitable carbon markets.

Ghana and South Africa highlight challenges and progress in emerging economies, particularly in MRV capacity and institutional coordination. California showcases a mature, well-regulated cap-and-trade system with strong safeguards and transparency. Brazil offers insights into managing complex governance in forest carbon markets and protecting community rights.

By exploring these cases, the chapter draws practical lessons to help Pakistan strengthen its governance frameworks and build a high-integrity carbon market aligned with both environmental and social ambitions, focused on helping the country with its net-zero ambitions.

Case Study I: Ghana – Early Institutional Readiness and Article 6 Alignment[16]

Context

Ghana has emerged as one of the most advanced countries in sub-Saharan Africa in preparing for participation in international carbon markets under Article 6 of the Paris Agreement. With a clear vision to leverage carbon finance for sustainable development, Ghana has positioned itself as a leader among developing countries in aligning national policies with the operational modalities of Article 6, including rules around corresponding adjustments and authorization of mitigation outcomes (UNFCCC, 2021).

Recognizing that carbon markets can unlock much-needed climate finance while also contributing to economic growth and social development, the Ghanaian government undertook a deliberate and proactive approach to institutional preparation. Ghana's climate ambition is embedded within its Nationally Determined Contribution (NDC), which outlines its intention to use international cooperation as part of its strategy to achieve mitigation targets (Republic of Ghana, 2021). To this end, Ghana began developing a robust governance framework well before many of its peers.

Key Innovations

At the heart of Ghana's strategy is the establishment of a comprehensive institutional architecture to govern carbon transactions. The Ministry of Environment, Science, Technology and Innovation (MESTI), through its Climate Change Directorate, acts as the Designated National Authority (DNA) responsible for evaluating and approving carbon market projects (MESTI, 2022).

16 https://cmo.epa.gov.gh/

Ghana has also developed a national Article 6 Framework that outlines procedures for project submission, approval, corresponding adjustments, benefit-sharing, and monitoring. One of Ghana's most notable achievements is its early commitment to implement corresponding adjustments for internationally transferred mitigation outcomes (ITMOs), a key requirement under Article 6.2. In collaboration with the Swedish Energy Agency, Ghana piloted a series of transactions under bilateral cooperation agreements, which are now serving as global models for how developing countries can credibly engage in Article 6 markets (Swedish Energy Agency, 2022).

Ghana has also prioritized stakeholder engagement, ensuring that carbon market activities align with the country's development priorities. Project proponents must demonstrate how their interventions contribute to Sustainable Development Goals (SDGs), such as poverty reduction, clean energy access, and biodiversity protection. Furthermore, Ghana has included mechanisms for civil society participation, social and environmental safeguards, and benefit-sharing frameworks (World Bank, 2023).

Challenges

Despite its leadership, Ghana faces certain implementation challenges. These include limited private sector capacity to generate high-quality carbon credits, nascent MRV (measurement, reporting, and verification) systems in some sectors, and the need for sustained international support to build institutional expertise (Gold Standard, 2023). However, these gaps are being addressed progressively through partnerships, training programs, and legal reforms.

Lessons for Pakistan

Ghana's experience offers a number of practical insights for Pakistan:

Lesson	Relevant Stakeholders in Pakistan
Start Early with Institutional Capacity: Ghana's foresight in building institutional architecture, well before final Article 6 rules were adopted, has allowed it to position itself as a credible player in carbon markets.	MoCC&EC Government body on carbon markets
Embrace Article 6 with Clarity: By aligning its domestic systems with the requirements of Article 6.2 (especially around corresponding adjustments), Ghana has reduced uncertainty and attracted international partnerships.	MoCC&EC Government body on carbon markets SECP MoFA
Integrate Development Co-Benefits: Ghana's insistence on aligning carbon projects with the SDGs ensures that climate action also drives social and economic	MoCC&EC Planning Commission NGOs like WWF, AKF
Ensure Participation and Safeguards: Transparent stakeholder engagement and benefit-sharing frameworks have helped Ghana avoid the backlash and distrust that have plagued carbon projects in other countries.	MoCC&EC Government body on carbon markets Provincial departments on forests, environment, finance, and social welfare NGOs like WWF, AKF
Leverage Bilateral Partnerships: Collaborating with donor countries and international buyers can help build credibility, pilot new models, and scale market readiness	MoFA MoCC&EC

In summary, Ghana exemplifies how a developing country can design and operationalize a high-integrity carbon market by combining political commitment, institutional clarity, international cooperation, and inclusive governance. For Pakistan, Ghana provides a template for building trust in its emerging carbon market and aligning it with both climate objectives and developmental aspirations.

Case Study II: South Africa – Building Integrity through a Robust MRV Framework in a Domestic Carbon Market[17]

Context

South Africa is one of the few African countries to implement a national carbon pricing mechanism grounded in a legally enforceable framework. As the continent's largest emitter, with over 450 $MtCO_2e$ annually, South Africa faces domestic and international pressure to reduce emissions, particularly in the coal-dependent energy and industrial sectors[18]. In response, the government introduced a Carbon Tax Act in 2019, which not only sets a price on emissions but also stimulates mitigation through a domestic offset mechanism.

What makes South Africa's approach notable is its early investment in a robust MRV (Monitoring, Reporting, and Verification) system to ensure transparency, accountability, and environmental integrity. This MRV framework underpins both its compliance carbon tax and its readiness to engage in international carbon market mechanisms under Article 6 of the Paris Agreement.

Key Innovations: MRV as the Foundation of Market Credibility

At the core of South Africa's carbon market readiness is the National Greenhouse Gas Emissions Reporting Regulations, established under the National Environmental Management: Air Quality Act. These regulations form the backbone of the country's MRV system and are designed to ensure accurate, transparent, and verifiable emissions data from major sectors, including energy, manufacturing, transport, and agriculture.[1]

Key features of South Africa's MRV framework include:

- Legally Mandated Reporting: Facilities emitting more than the threshold (10,000 tCO_2e/year) are legally required to submit annual emissions reports using the Department of Forestry, Fisheries and the Environment's (DFFE) GHG Emissions Reporting System.[19]
- Standardized Methodologies: Emissions must be calculated using IPCC-aligned Tier 2 or Tier 3 methodologies, ensuring technical rigor and comparability across sectors.
- Third-Party Verification: To qualify for tax offsets or carbon market participation, project emissions and reductions must be independently verified by accredited auditors.
- Offset Project Registry and Transparency Portal: The DFFE maintains a registry of eligible offset projects, and the government has approved international standards (CDM, Verra, Gold Standard), subject to South African-specific eligibility rules.
- Sectoral Guidelines and Training: The government has developed sector-specific MRV guidelines (e.g., for mining, energy, transport) and provided capacity-building programs for emitters, verifiers, and project developers.

This strong MRV foundation has enabled South Africa to integrate offset use into its carbon tax policy, where entities can use verified domestic carbon credits to reduce their tax liability by up to 10% depending on the sector (National Treasury, 2020). a growing domestic ecosystem of carbon offset projects and service providers

17 https://transparencypartnership.net/sites/default/files/ws15223_south_africa_gpa2015_en_fin_web.pdf
18 https://iea.blob.core.windows.net/assets/830fe099-5530-48f2-a7c1-11f35d510983/WorldEnergyOutlook2022.pdf
19 https://static.pmg.org.za/Nersa_Annual_Report_2021_.pdf

has emerged, particularly in renewable energy, waste management, and land use. Environmental Management: Air Quality Act. These regulations form the backbone of the country's MRV system and are designed to ensure accurate, transparent, and verifiable emissions data from major sectors, including energy, manufacturing, transport, and agriculture.[20]

Challenges

While South Africa's MRV framework is among the most advanced in the region, challenges persist:

- Fragmentation in Governance: Coordination between the DFFE (responsible for MRV and environmental integrity) and National Treasury (responsible for the tax) can be complex, leading to occasional bottlenecks in implementation.
- Capacity Gaps: Smaller companies, municipalities, and project developers still face technical challenges in navigating MRV requirements and verification processes.
- Article 6 Alignment Still Evolving: While South Africa has laid the groundwork for participation in Article 6, it has yet to operationalize corresponding adjustments or authorize mitigation outcomes under a national Article 6 framework.
- Limited Community Engagement: Unlike countries like Ghana, South Africa's MRV and offset frameworks do not yet systematically integrate social safeguards or benefit-sharing mechanisms for local communities.

Lessons for Pakistan

South Africa's MRV-focused experience provides several key takeaways for Pakistan:

Lesson	Relevant Stakeholders in Pakistan
Develop a Legal Framework for MRV Early: South Africa's legally mandated GHG reporting regulations help ensure market credibility. Pakistan should similarly institutionalize MRV through legislation, not	MoCC&EC Higher judiciary including SCP SECP Ministry of Law & Justice
Use MRV to Unlock Market Access: A strong MRV framework can attract both domestic and international buyers, enabling Pakistan to participate credibly in	MoCC&EC Research think-tanks such as SDPI
Align MRV with Taxation and Incentives: Linking MRV systems to fiscal instruments (e.g., carbon tax, subsidies) can create economic incentives for emissions reductions while ensuring accountability.	MoF FBR
Capacity Building Must Be Sector-Specific: South Africa's sectoral guidelines and training initiatives can serve as a model for Pakistan in developing tailored MRV approaches for priority sectors.	MoCC&EC SECP
Bridge Domestic Systems to International Standards: By accepting CDM, Verra, and Gold Standard methodologies—while requiring domestic validation—South Africa has created a hybrid model that Pakistan can adapt to its national context.	MoCC&EC Government body on carbon markets

20 https://www.dffe.gov.za/sites/default/files/docs/nir-2017-report.pdf

Case Study III: California – Leading with Integrity through Cap-and-Trade[21]

California, a global pioneer in climate policy, has established one of the world's most sophisticated carbon markets through its landmark Cap-and-Trade Program. Launched in 2013 by the California Air Resources Board (CARB), the program has become a cornerstone of the state's ambitious climate goals, which include reducing greenhouse gas emissions to 40% below 1990 levels by 2030 and achieving net-zero emissions by 2045. What sets California apart is not only the scale of its carbon market, covering about 85% of the state's emissions, but also the strength of its environmental safeguards, transparency mechanisms, and a robust MRV system that underpins market credibility.

The backbone of California's approach is its legally enforceable, declining emissions cap, which ensures that total emissions from covered sectors steadily fall over time. This is achieved through a fixed number of allowances, distributed via quarterly auctions or free allocation, depending on sectoral needs. Revenue generated through these auctions, over $20 billion to date, has been strategically reinvested in climate adaptation, renewable energy, and projects that benefit disadvantaged communities, reinforcing the link between market-based action and social equity.

Integral to California's market integrity is its world-class MRV framework. All covered entities are required to report their annual emissions using standardized, sector-specific protocols, which are aligned with international best practices and IPCC guidelines. These reports are submitted through a centralized digital platform: Cal e-GGRT, and must undergo independent third-party verification from accredited entities. The accuracy and consistency demanded by this system make it a global benchmark, ensuring that every tonne of carbon reduced is real, measurable, and accountable.

Another defining feature of California's carbon market is its careful incorporation of carbon offsets. The state allows companies to meet a limited share of their compliance obligations, currently 4% to 6%, using verified offset credits, but only from projects that meet stringent environmental, social, and technical standards. Eligible project types include forest conservation, mine methane capture, and rice cultivation, and all are subject to protocols developed or approved by CARB. Each offset project must demonstrate additionality, permanence, and leakage prevention, and must contribute to environmental and community co-benefits. The inclusion of a buffer pool, which acts as insurance against unintentional reversal, such as forest fires, further enhances the credibility of these instruments.

California's carbon market is not confined by state borders. It is linked with Québec's cap-and-trade system through the Western Climate Initiative (WCI), allowing for cross-border trading of allowances while maintaining rigorous oversight. This model of cooperation shows that regional carbon markets can be successfully integrated while upholding environmental integrity, offering a template for future international Article 6 linkages.

Despite its strengths, California's program is not without criticism. Environmental justice advocates have raised concerns that heavy polluters can continue operating in marginalized communities by purchasing offsets rather than reducing local emissions. This has sparked debates about how carbon markets intersect with equity and environmental health. In response, California has strengthened stakeholder engagement and is exploring reforms to better align the program with environmental justice priorities.

California's cap-and-trade program exemplifies how a high-integrity, transparent, and enforceable carbon market can function at scale. Its strong legal foundation, advanced MRV

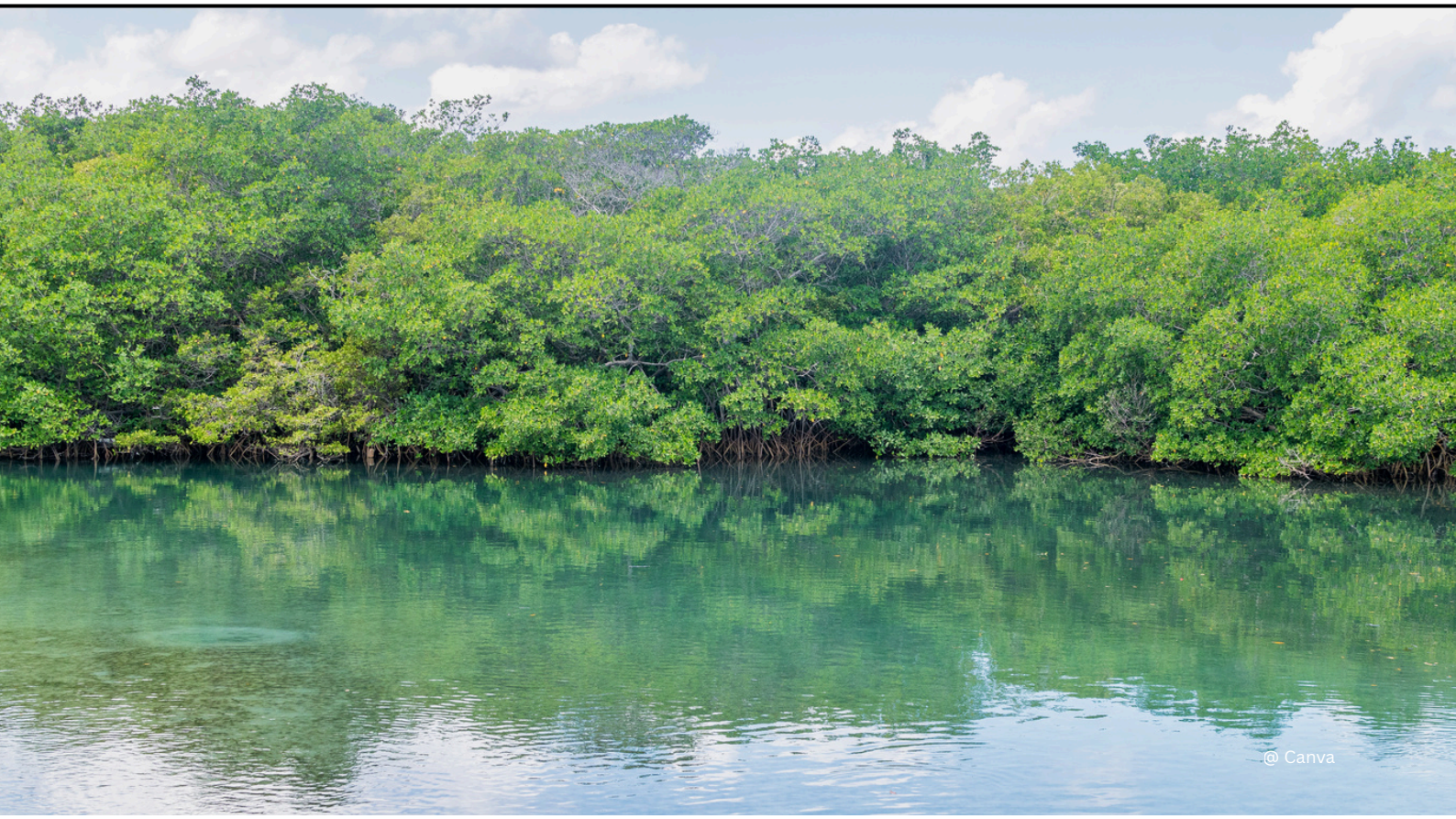
21 https://icapcarbonaction.com/en/ets/usa-california-cap-and-trade-program

infrastructure, careful offset design, and reinvestment of revenues into climate resilience and equity offer valuable lessons for developing countries, including Pakistan. For a country like Pakistan, California's example underscores the importance of investing in credible data systems, transparent governance, and equitable policy design from the outset.

Lessons for Pakistan

California's experience provides several key takeaways for Pakistan:

Lesson	Relevant Stakeholders in Pakistan
Strong regulatory enforcement and mandatory transparency build buyer confidence.	Ministry of Climate Change & Environmental Coordination (MoCC&EC)
	Securities & Exchange Commission of Pakistan (SECP)
	Provincial EPAs
Early pilot programs aided ecosystem maturity.	MoCC&EC
	Government body on carbon markets
	Private sector corporations



Case Study IV: Brazil – Navigating Governance Challenges in Carbon Market Development[22]

Brazil holds a crucial role in the global climate landscape, largely due to its vast tropical forests that act as significant carbon sinks, especially in the Amazon region. While Brazil's natural endowments offer enormous potential for carbon markets, particularly through REDD+ initiatives, the governance of these markets remains complex and fragmented.

Governance Structure and Institutional Framework

Brazil's governance of carbon markets is characterized by a mosaic of institutions with overlapping mandates and evolving regulatory frameworks. The National Climate Change Policy provides a broad vision for emissions reductions, but concrete carbon market regulations are still under development, lacking clarity on key aspects such as carbon rights, offset standards, and market oversight bodies.

Several federal and state-level agencies are involved in carbon market-related activities: the Ministry of Environment (MMA) sets overarching policy directions; the Brazilian Forest Service (SFB) handles forest monitoring and conservation; and the National Institute for Space Research (INPE) provides cutting-edge satellite data for deforestation monitoring. However, coordination among these entities is often limited, leading to gaps in enforcement and regulatory consistency.

Transparency and Monitoring

One of Brazil's governance strengths is its use of advanced remote sensing technology by INPE, which enables near real-time monitoring of deforestation and land-use change. This technological backbone is critical for transparent Measurement, Reporting, and Verification (MRV) of emissions from forest activities, which is a core requirement for credible carbon accounting. Yet, the integration of this data into formal carbon market mechanisms remains a work in progress, hindered by insufficient institutional capacity to translate monitoring outputs into enforceable compliance mechanisms.

Community Rights and Social Safeguards

Governance challenges also stem from the need to protect indigenous and local community rights. Brazil's complex land tenure systems and ongoing conflicts over forest lands complicate the establishment of clear carbon ownership and benefit-sharing arrangements. While some REDD+ pilot projects incorporate participatory processes and social safeguards, these are not yet uniformly embedded in the national governance framework, risking exclusion or marginalization of vulnerable groups.

Regulatory Gaps and Legal Uncertainties

The absence of comprehensive carbon market legislation creates uncertainty for investors and project developers. Key governance gaps include unclear definitions of carbon assets, limited frameworks for ensuring additionality and permanence of emission reductions, and weak mechanisms for addressing leakage risks. inconsistent enforcement of environmental laws and political shifts have, at times, undermined regulatory stability, affecting market confidence.

22 Developing a Carbon Market, Natascha Trennepohl (2021)

Lessons for Pakistan

Brazil's experience underscores the critical importance of establishing a coherent and coordinated governance architecture before scaling carbon market activities. For Pakistan, this means clearly defining institutional roles and responsibilities to avoid regulatory fragmentation. Investing in advanced MRV systems, leveraging satellite technology paired with ground verification, can enhance transparency and build trust. Equally important is embedding robust social safeguards and securing the rights of local communities to ensure equitable participation.

Brazil's experience provides several key takeaways for Pakistan:

Lesson	Relevant Stakeholders in Pakistan
Develop a coherent and coordinated governance architecture before scaling carbon market activities.	Prime Minister Office MoCC&EC Government body on carbon markets
Clear definition of institutional roles and responsibilities to avoid regulatory fragmentation	Prime Minister Office Parliament Ministry of Law & Justice
Investing in advanced MRV systems, leveraging satellite technology paired with ground verification, can enhance transparency and build trust.	MoCC&EC Universities Research think-tanks Private sector
Embedding robust social safeguards and securing the rights of local communities to ensure equitable participation	MoCC&EC Provincial departments on forests, environment, finance, and social welfare Private sector

In summary, Brazil's governance challenges illustrate that natural resource wealth alone does not guarantee a successful carbon market. Strong, transparent, and inclusive governance frameworks are indispensable to harness carbon finance for sustainable development effectively.

CORE FINDINGS BASED ON THE CASE STUDIES

Country	MRV System	Benefit-sharing & Equity	Lessons for Pakistan
Ghana	National MRV framework – data integrated into A6 registry	Independent grievance redress committee; strong benefit-sharing requirements with local communities.	1.Prioritize FPIC, equity, redressal mechanisms. 2.Independent MRV improves integrity and trust with partners.
South Africa	Driven by DNA, accredited, sectoral tracking	Equity lens in carbon tax policy; indirect redistribution of revenues	Build accredited domestic MRV capacity to reduce reliance on foreign verifiers; develop registry and sectoral data protocols
California	High-integrity MRV; periodic third-party verifications; emissions registry integrated with Western Climate Initiative (WCI)	Strong safeguards, including environmental justice filters; public consultation mandatory; revenues reinvested in vulnerable communities.	Strong regulatory enforcement and mandatory transparency build buyer confidence; early pilot programs aided ecosystem maturity.
Brazil	Under development, being based on REDD+. Working with ICAO and Verra.	Early drafts of legislation included social safeguards and Indigenous rights clauses; REDD+ experience informs benefit-sharing.	Political alignment and long-term planning are crucial; ensure wide stakeholder participation and legal codification of institutional responsibilities

EQUITY, BENEFIT-SHARING, AND INCLUSION WITHIN THE CARBON MARKETS IN PAKISTAN

Understanding the problem

While carbon markets are often framed as an economic mechanism, they are ultimately implemented within real socio-political contexts. The processes surrounding their development and governance must reflect the interests and rights of the people and communities most affected by them. Even though within the guidelines and the rules, equitable benefit sharing is recognized as an objective of the carbon markets and it is also recognized as an outcome, with the Ministry (also the National Designated Authority for the carbon markets) responsible for being the primary proponent of the equitable benefit sharing arrangements, the mechanism remains notably underrepresented in the existing guidelines.

Specifically, the guidelines and the development process do not outline clear methods for identifying which communities or groups should benefit, nor do they define eligibility criteria for participation. There is no framework for community-level capacity building to ensure local actors can meaningfully engage in carbon projects or claim benefits. Moreover, the guidelines do not reference international standards on equity, social safeguards, or benefit-sharing frameworks, such as those promoted by the Green Climate Fund or the Climate, Community & Biodiversity Standards, leaving a gap in ensuring fairness, transparency, and inclusivity. In practice, this means that vulnerable or marginalized groups may be left out of decision-making processes, risk receiving fewer benefits than intended, or face inequitable impacts from projects implemented in their localities. Without formalized processes, the stated goal of equitable benefit sharing risks remaining aspirational rather than actionable.

Concerns around equity and fairness featured prominently in stakeholder feedback. Many participating stakeholders questioned whether the benefits of carbon markets, particularly the financial returns from carbon credit transactions, would be distributed equitably among local stakeholders. This concern was especially salient in the context of local communities, who are often the direct stewards of forests, rangelands, and other carbon sinks. While these communities are essential to the long-term sustainability of carbon mitigation activities, there is limited evidence about their contribution to the development of carbon markets regime in Pakistan.

Carbon projects can bring significant money, but if communities don’t see tangible benefits, you risk backlash, land conflicts, and ultimately, project failure. This point was echoed in several discussions, reinforcing the point that local ownership is not just a rubberstamping process, but essentially, a prerequisite for the success of any carbon market or offsetting initiative. Without mechanisms to ensure that benefits reach the ground level, the risk of opposition, project disruption, or even legal disputes increases significantly.

Despite several precedents of designing projects and policies through participatory approaches, the carbon market development in Pakistan appears to lack clear systems for ensuring accountability to affected communities. Interviewees expressed concern over the limited consultation with local stakeholders, civil society organizations and even private sector actors

during key phases of project planning and policy development. This lack of consultation leads to the point that the development process has largely been a top-down exercise, without an assessment of market readiness and needs. In some cases, there has even been reluctance to incorporate or utilize existing community-level data, such as vulnerability assessments or socio-economic profiles, which could otherwise be used to inform project design and ensure that interventions are responsive to local realities.

In summary, stakeholder feedback strongly suggests that the current development of carbon markets in Pakistan is constrained by insufficient attention to inclusivity and community rights. Without meaningful stakeholder engagement and accountable governance structures, carbon markets risk reproducing existing inequities rather than addressing them. Ensuring the participation and protection of local communities is not an optional add-on - it is central to the credibility, effectiveness, and long-term success of any carbon market initiative.

RECOMMENDATION: INSTITUTIONALIZE SAFEGUARDS, EQUITY, AND PUBLIC PARTICIPATION

Carbon markets, especially those rooted in land use, forestry, and community-managed landscapes, potentially the primary sectors in Pakistan, carry profound implications for the rights, agency, and livelihoods of Indigenous Peoples and Local Communities (IPLCs). If poorly designed, they risk reinforcing inequality, triggering land dispossession, and undermining the very development goals they seek to support. In Pakistan, where much of the carbon market potential lies in natural ecosystems such as mangroves, rangelands, and forests, it is essential to embed social safeguards and mechanisms for equity and participation into the legal and operational architecture of the carbon market.

The analysis of governance gaps in this report shows that existing legal frameworks do not sufficiently safeguard the rights of vulnerable groups in carbon credit generation or revenue sharing. There is also a lack of structured processes for consultation, grievance resolution, and gender inclusion. Without institutionalizing safeguards and embedding equity considerations, Pakistan's carbon market risks becoming extractive failing to gain community trust and triggering reputational and implementation risks that could affect long-term viability.

Identification of beneficiaries

In any high-integrity carbon market framework, the fair and strategic identification of beneficiaries is a cornerstone for ensuring equity, legitimacy, and long-term sustainability. This process is particularly important for Indigenous Peoples and Local Communities (IPLCs), who are often both the stewards of critical ecosystems and among the most vulnerable to climate change impacts.

Beneficiaries should be identified through an impact-focused approach, prioritizing those with the highest socio-economic and climate vulnerability, as well as those with a direct role in managing and protecting ecosystems that generate carbon credits. This includes resident communities in Protected Areas, Other Effective Area-Based Conservation Measures (OECMs), Key Biodiversity Areas (KBAs), and ecologically significant eco-regions. By focusing on these groups, benefit flows can be aligned with conservation outcomes, reinforcing both climate mitigation and biodiversity protection objectives.

To maintain credibility and fairness, the eligibility criteria for beneficiaries must be clearly defined, transparently communicated, and consistently applied across all projects. These criteria could include socio-economic indicators such as income levels, access to essential services, and dependence on climate-sensitive sectors like agriculture, forestry, and fisheries. They may also account for climate vulnerability, measured through exposure to hazards like floods, droughts, and extreme heat, as well as adaptive capacity and resilience levels. An additional consideration is the degree to which community groups contribute to ecological stewardship, whether through sustainable resource management, biodiversity protection, or traditional conservation practices.

Geographical proximity is another important factor. Projects should be zoned so that the benefits of carbon finance reach communities closest to the areas where emissions are generated or sequestered. This strengthens the connection between offsetting activities and local development, fostering trust and ownership among participating communities.

Ultimately, the identification of beneficiaries is not merely a technical step; it is a governance measure that determines the social legitimacy of carbon markets. A transparent, participatory, and criteria-driven process ensures that benefits are directed where they are most needed, while also promoting community engagement, building trust, and safeguarding the long-term integrity of carbon market projects.

Learning from Domestic Experience: The Trophy Hunting Model

Pakistan has a successful precedent for equitable benefit-sharing in the form of its Community-Based Trophy Hunting Programme (CBTHP), operational in areas such as Gilgit-Baltistan, Chitral, and parts of Baluchistan. Under this model, local communities are granted co-management rights over wildlife conservation areas. Revenues from the controlled hunting of specific species, particularly the Markhor and the Himalayan Ibex, are split between the provincial government and the local communities, with communities typically receiving 80% of the trophy fees. These funds are channelled into village development activities, including education, infrastructure, and health.

Critically, the program succeeded not only because of revenue distribution, but because communities were treated as rights-holders and stewards of the landscape. They were consulted in decision-making, empowered to monitor illegal hunting, and involved in wildlife management. The result has been not only increased community income but also a resurgence in local wildlife populations.

This model holds valuable lessons for carbon markets: benefit-sharing must be clearly defined, transparently disclosed, and legally enforceable. communities must be engaged not as passive recipients but as active co-creators and custodians of climate assets.

Institutionalizing Free, Prior and Informed Consent (FPIC)

The cornerstone of equitable carbon markets is the principle of Free, Prior, and Informed Consent (FPIC) which ensures that communities can participate meaningfully in decisions about land use, project design, and benefit-sharing before any activities begin. In Pakistan, however, FPIC is not embedded in any binding legal instrument governing carbon projects. Instead, community consultation remains discretionary, often handled by third-party developers or NGOs with varying standards.

To institutionalize FPIC, Pakistan must create national guidelines that outline who qualifies as a rights-holder, what constitutes valid consent, how it must be documented, and under what circumstances it can be withdrawn. This should be linked to project registration and validation protocols. The guidelines should also account for the complexities of customary tenure, gender roles, and intra-community dynamics, particularly in areas with overlapping claims or contested histories.

This process must be supported by dedicated facilitators trained in participatory methods, local languages, and dispute mediation. FPIC cannot be reduced to a checklist, it must become a living process embedded in every stage of the project lifecycle, from feasibility assessment to credit issuance and post-credit monitoring.

Grievance Redressal Mechanism

Another critical safeguard is the creation of a national-level Grievance Redress Mechanism (GRM), designed to resolve conflicts around land rights, benefit sharing, MRV disputes, and consent violations. Ghana provides a replicable model, where an independent grievance redress committee sits within its carbon governance structure, empowered to hear complaints from communities, developers, and government agencies.

Pakistan can adapt this model to its federal context by establishing a multi-stakeholder GRM housed under the proposed National Carbon Coordination Council (NCCC). The mechanism must be accessible in local languages, deploy community outreach staff, and maintain a public record of decisions. Importantly, the GRM must have legal standing, with authority to halt or revise projects found in violation of safeguards. This would not only protect communities but also boost investor confidence in the governance of Pakistan's carbon market.

Using Social and Vulnerability Data for Targeting and Prioritization

Pakistan already collects substantial social vulnerability and IPLC data through household surveys, forest tenure mapping, and national development indices. However, this data is rarely integrated into climate planning or carbon project design. For instance, the Pakistan Bureau of Statistics (PBS) and provincial planning departments maintain detailed poverty, education, and infrastructure data at the district and even union council level. Similarly, MoCC&EC has collected geo-referenced vulnerability data under the National Adaptation Plan (NAP) and REDD+ programs.

These datasets offer a critical opportunity to target carbon market investments where they are most needed such as in high-risk, low-income, or underrepresented regions, especially those affected by climate-induced loss and damage (L&D). They can also inform the design of differentiated benefit-sharing frameworks, prioritizing more vulnerable groups in revenue distribution.

Institutionalizing such data usage requires formal coordination between climate authorities and data custodians such as PBS, NADRA, and provincial planning boards. The silver lining is that data on social vulnerabilities exists for most local communities and is held by NGOs, which can be tapped easily. A unified Social Equity Atlas for Carbon Markets can be developed to guide screening, impact assessment, and reporting.

Gender and Vulnerability Lenses in Revenue Allocation

Another gap in Pakistan's carbon market readiness is the lack of gender-disaggregated approaches. Women, particularly in rural and indigenous communities, often face multiple barriers, legal, cultural, and economic, in accessing climate finance or participating in consultations. Revenue distribution mechanisms that ignore gender dynamics may entrench existing inequalities or overlook women's contributions to conservation and land stewardship.

gender and vulnerability lenses must be built into the entire project lifecycle from design and stakeholder mapping to revenue allocation and reporting. One way to operationalize this is through mandatory gender and inclusion impact assessments as part of the project validation process, along with specific quotas or financial earmarks for women-led or women-benefiting initiatives.

This aligns with international best practices and ensures that Pakistan's carbon markets contribute to its Sustainable Development Goal (SDG) commitments, especially on gender equality (SDG 5) and reducing inequalities (SDG 10).

Adaptive Benefit Sharing

Benefit sharing in carbon market projects should not be treated as a static, one-time arrangement. Instead, it must be adaptively designed to evolve over time in response to changing project conditions, community needs, and broader socio-economic or environmental contexts. An adaptive benefit-sharing framework ensures that the distribution of benefits remains fair, relevant, and aligned with both climate and development objectives throughout the project lifecycle.

At its core, adaptive benefit sharing involves regular review and adjustment of benefit allocation mechanisms. These reviews should be informed by participatory monitoring, stakeholder feedback, and updated socio-economic and vulnerability data. For example, if a community's climate vulnerability increases due to new hazards—such as more frequent flooding or crop failures—its share of benefits could be proportionally increased. Similarly, if certain groups demonstrate greater contributions to ecosystem protection or project performance, the framework should allow for recognition and additional support.

Crucially, adaptive benefit sharing must be kept distinct from other financial flows such as payments for ecosystem services (PES) or Loss and Damage (L&D) compensation. Carbon market revenues should complement, not replace, these other funding streams. This separation helps avoid double-counting benefits and ensures that communities receive the full range of resources they are entitled to under different climate finance mechanisms.

An adaptive approach also strengthens community trust and project resilience. By committing to periodic benefit reviews and updates, project developers and government institutions signal that community needs are not only recognized but will continue to be addressed over time. This flexibility is particularly important for long-term carbon projects, which often span decades and take place in dynamic environmental and economic contexts.

Ultimately, adaptive benefit sharing moves beyond a fixed contractual arrangement to become an ongoing partnership between carbon market actors and local communities. It reflects a

recognition that equitable climate finance is a process, not an event—and that sustainable carbon markets must be capable of evolving alongside the people and ecosystems they aim to protect.

Building Trust and Transparency for Long-Term Impact

At its core, the success of any carbon market hinges not only on emissions accounting, but on trust—between communities and the state, between developers and regulators, and between buyers and suppliers. Safeguards, equity measures, and participatory mechanisms are not merely ethical obligations; they are strategic necessities that reduce project risk, enhance market credibility, and ensure that carbon finance serves as a development multiplier rather than a transactional instrument.

To this end, Pakistan must embed these mechanisms into national law, institutional design, and public reporting. Transparent disclosure of project terms, community revenues, grievance outcomes, and impact metrics should be mandatory. A central Carbon Market Dashboard, publicly accessible and updated in real-time, can help institutionalize this transparency.

POLICY RECOMMENDATIONS AND WAY FORWARD

Recommendation 1: Establish Robust Data Infrastructure and Dynamic Baselines for Credible Carbon Market Functioning

A foundational gap in Pakistan's carbon market readiness lies in the absence of a centralized, credible, and harmonized data ecosystem for carbon emissions, land-use change, and socio-environmental variables. Carbon markets depend heavily on accurate, consistent, and verifiable data to quantify mitigation outcomes, assess additionality, and ensure environmental integrity. Without such infrastructure, Pakistan risks producing unverifiable credits, undermining investor confidence, and missing out on the credibility premium increasingly demanded in global carbon markets.

Legacy Systems and Emerging Opportunities

While Pakistan lacks a dedicated national carbon data platform, it does possess a mosaic of existing datasets and monitoring frameworks that, if integrated and scaled, can lay the foundation for a robust MRV system.

The REDD+ MRV system, developed under the Forest Carbon Partnership Facility, led by the Pakistan Forest Institute (PFI), is a key asset in this regard. It provides spatially explicit, historically validated forest cover and carbon stock data for key provinces and serves as a foundational baseline for land-based emissions accounting. However, its utility has remained underexploited beyond forestry. The system remains siloed within the forestry and environment ministries and has not been integrated into cross-sectoral mitigation planning, carbon project development, or Article 6 readiness efforts. Expanding the REDD+ MRV system across sectors, such as agriculture, waste, and energy, offers a pathway to building a national carbon data observatory with sectoral depth and spatial resolution.

Likewise, institutional data assets held by agencies such as the PBS and provincial environmental protection agencies contain valuable activity-level datasets that can serve as building blocks for baseline setting. However, these datasets suffer from problems of fragmentation, inconsistent granularity, limited accessibility, and outdated methodologies. The private sector can play an integral role in filling the data gaps too, as is being done presently by Engro Corporation, in numerous capacities, as well as NGOs, such as WWF-Pakistan, IUCN, and the Aga Khan Foundation.

The Case for Dynamic, Sector-Specific Baselines

In the context of carbon markets, the baseline scenario is critical to assessing additionality and issuing credible credits. Yet in Pakistan, the current approach to baselines has largely involved applying static, generic default values drawn from international methodologies (e.g., CDM or Verra). This approach ignores local dynamics and risks inflating mitigation claims.

Moving forward, Pakistan must develop dynamic, context-specific baselines for key sectors and project types, using a combination of historical data, activity trends, satellite monitoring, and scenario modelling. The use of dynamic baselines periodically updated to reflect policy changes, economic shifts, or improved data, ensures environmental integrity and avoids over-crediting. Countries like South Africa and Brazil are already advancing in this direction, developing national baselines tailored to their economic sectors and regional profiles.

Dynamic baselines also create more equitable outcomes. For example, communities involved in land restoration or mangrove projects may experience fluctuations in carbon sequestration due to external climate factors. Adaptive baselines, adjusted using monitored data, can ensure these fluctuations do not penalize or unjustly reward project developers or host communities.

Strengthening Data Governance and Integration

To operationalize a data-driven carbon market architecture, Pakistan needs to strengthen institutional mandates, coordination mechanisms, and digital infrastructure for data generation, sharing, and validation.

A key starting point is to establish a National Carbon Data Repository, housed either within the MoCC&EC or as an autonomous entity governed by an autonomous body (details discussed in next section). This repository should aggregate data from sectoral agencies, provincial departments and private-sector registries, and be complemented by data from international data sets such as the World Database of Protected Areas (WDPA), Global Mangrove Watch (GMW) and Global Forest Watch. Access protocols should ensure that developers, verifiers, and regulators can retrieve relevant datasets for project development, MRV, and policy analysis.

In parallel, data quality standards and data-sharing protocols must be legally codified. This includes defining which entities can generate primary data, who is responsible for validation, how often data must be updated, and what quality assurance mechanisms are in place. Institutional clarity on data ownership and custodianship, particularly across federal and provincial agencies, is vital to avoid duplication or conflict.

Recommendation 2: Strengthen Legal and Regulatory Foundations

A robust legal and regulatory foundation is paramount to establishing an effective, credible, and sustainable carbon market in Pakistan. As carbon markets evolve into complex instruments involving diverse stakeholders, government agencies, private sector entities, local communities, and international investors, the absence of a coherent and comprehensive legal framework introduces critical vulnerabilities. These include unclear property rights over carbon assets, institutional overlaps, inconsistent enforcement, and risks of social and environmental harm. Strengthening the legal infrastructure offers a systemic opportunity to clarify these dimensions and align Pakistan's carbon market architecture with international best practices.

Enact a Comprehensive Carbon Market Law

The cornerstone of effective governance is the enactment of a comprehensive carbon market law that serves as the primary legal mandate for all activities related to carbon trading in Pakistan. Currently, the regulatory environment is fragmented, with multiple guidelines and policies but lacking an overarching statutory instrument. This fragmentation inhibits regulatory certainty, deters investor confidence, and impedes transparent enforcement.

A dedicated carbon market law should unambiguously define critical elements such as carbon rights, delineating ownership and transferability of emission reduction units. Defining carbon rights is essential to prevent disputes over who can generate, own, and trade carbon credits. Clear articulation of these rights must be grounded in Pakistan's existing property and environmental laws, adjusted to accommodate carbon assets as intangible environmental commodities.

Furthermore, the law should delineate the market's scope, explicitly distinguishing between compliance-driven carbon markets, linked to regulatory emission reduction targets and voluntary markets catering to private corporate social responsibility and net-zero commitments. Clarifying this dual-market framework will ensure tailored regulatory approaches that reflect differing accountability and reporting standards.

Project eligibility criteria and standards must be legally mandated within the statute, prescribing baseline methodologies for emissions reduction quantification, MRV protocols, and requirements for additionality, permanence, and leakage control. This legal codification prevents regulatory arbitrage and enforces consistency across projects, aligning Pakistan with international standards such as those promulgated by the Verified Carbon Standard (VCS) or the Clean Development Mechanism (CDM).

Finally, enforcement mechanisms must be clearly prescribed, including penalties for non-compliance, fraud, or misreporting, and powers for regulatory authorities to audit, suspend, or revoke project registrations. A well-defined legal enforcement regime fosters market integrity, deters malpractices, and protects environmental outcomes.

Clarify Roles and Jurisdictions: Federal–Provincial Interface

Pakistan's constitutional framework distributes environmental and economic governance responsibilities across federal and provincial tiers, creating complex jurisdictional intersections. Carbon market governance inherently intersects multiple domains, including environmental regulation, forestry, land use, taxation, and community rights, each potentially falling under different institutional mandates, and moreover raises the most important question of 'Who owns carbon?'

Ambiguity or overlap in institutional roles can cause inefficiencies, regulatory gaps, and conflicts, risks that undermine the functionality and credibility of carbon markets. For instance, unclear delineation between the MoCC&EC, the Ministry of Finance, and provincial environmental ministries, on where carbon and climate finance rests.

To address this, the carbon market law must explicitly codify roles, responsibilities, and coordination mechanisms among federal and provincial institutions in compliance with constitutional provisions, in spite of MoCC&EC has been designated as the DNA, but not having the mandate to fully implement the market.

Legal clarity in jurisdictions will also facilitate smoother intergovernmental data sharing and operational cooperation, which is key for effective MRV systems and safeguard enforcement. This could be institutionalized through formal inter-agency agreements, joint committees, or dedicated carbon market oversight bodies with representation from both federal and provincial entities.

Mandate Safeguards and Equity Clauses in Legislation

Ensuring social and environmental integrity within carbon markets necessitates embedding explicit legal protections for community rights, benefit-sharing, and environmental safeguards. Currently, these elements are inconsistently addressed and often relegated to voluntary project standards or guideline recommendations, limiting enforceability.

Environmental safeguards must also be legally mandated to prevent negative impacts such as biodiversity loss, ecosystem degradation, or carbon leakage. The legislation should integrate principles from internationally recognized safeguard frameworks (e.g., World Bank Environmental and Social Framework) to ensure comprehensive risk management.

Institutionalizing a comprehensive legal and regulatory framework represents a foundational step toward building Pakistan's carbon market into a credible, transparent, and equitable mechanism for climate mitigation and sustainable development. Such a framework would resolve existing ambiguities around carbon rights, streamline federal-provincial coordination, and embed critical safeguards that protect both environmental integrity and vulnerable communities.

By doing so, Pakistan can create a systemic enabling environment that attracts private and international investment, aligns with global carbon market standards, and ensures that climate finance mechanisms contribute meaningfully to its nationally determined contributions (NDCs) under the Paris Agreement. This legal certainty and clarity are indispensable for operationalizing a high-integrity carbon market that not only mitigates emissions but also supports just, inclusive, and resilient development pathways.

Recommendation 3: Leverage and Upgrade Existing Institutional Mechanisms

A critical shortcoming in Pakistan's carbon market governance landscape is the absence of coherent, institutionalized coordination among relevant ministries, regulatory bodies, and provincial authorities. These institutional fragmentation issues are further exacerbated by limited technical capacity and underutilization of existing data systems, many of which already hold the potential to support credible carbon market infrastructure. This recommendation focuses on systemic reforms that do not require entirely new architecture but rather smart upgrades to Pakistan's existing institutions and mechanisms, in particular the REDD+ MRV framework, to establish a robust, cross-sectoral governance regime for carbon markets.

Unlocking the Value of Existing Institutions and Data Systems

Pakistan's institutional ecosystem relevant to carbon markets includes a wide range of institutions. Each of these manages valuable climate-related datasets or oversees regulatory responsibilities relevant to emissions measurement, mitigation, or market engagement. However, these institutional assets are often siloed, lack formalized channels of collaboration, and operate without a unified governance framework for carbon markets.

Rather than designing entirely new institutions, Pakistan can achieve faster and more sustainable progress by reforming mandates, standardizing data-sharing protocols, and clarifying institutional roles and accountability structures. The goal is not to replicate new capacities from scratch but to upgrade existing functions and repurpose them to serve a coordinated, transparent, and high-integrity carbon market.

The REDD+ MRV System as a Model and Technical Backbone

Perhaps the most promising opportunity lies in the REDD+ MRV infrastructure, which was developed under the UNFCCC framework and is already operational in the forestry sector. It provides a baseline for carbon emissions and removals, tracks deforestation and forest degradation through satellite monitoring, and incorporates community-based monitoring in some jurisdictions. This system was developed with substantial donor support and has been subjected to international peer review, giving it technical credibility.

By expanding the REDD+ MRV system beyond forestry, Pakistan can quickly build out a multi-sectoral emissions accounting and validation system without incurring prohibitive new costs. For example, remote sensing and satellite monitoring can be used for forest change can be repurposed for land-use projects, carbon farming, or renewable energy site monitoring, as well as the existing institutional relationships between MoCC&EC and provincial forest departments can be scaled to include provincial planning, environment and finance ministries, facilitating smoother intergovernmental coordination. Importantly, REDD+ data practices, such as maintaining historical baselines, ensuring transparency in emissions calculations, and conducting participatory verifications, should be adopted as minimum standards for all carbon market MRV systems in Pakistan.

Creating a National Carbon Coordination Council (NCCC)

To move beyond fragmented institutional operations, Pakistan should establish a National Carbon Coordination Council (NCCC), a centralized governance body tasked with overseeing carbon market development and coordinating roles across ministries, provinces, and regulatory agencies.

This council should be legally mandated and chaired by a high-level authority (e.g., the Prime Minister's Office or Planning Commission) to ensure inter-ministerial compliance and to de-fragment decision-making authority.

The NCCC should comprise representatives from MoCC&EC, MoF, MoE, AEDB, PBS, provincial environment departments, and other sectoral ministries such as energy, industry, and agriculture. Its primary functions would include:

- Coordinating national carbon market strategies and institutional responsibilities;
- Developing and endorsing national MRV protocols for multiple sectors;
- Overseeing the creation and maintenance of a centralized National Carbon Registry;
- Ensuring compliance with both domestic legal frameworks and international reporting obligations (e.g., under Article 6 of the Paris Agreement);
- Facilitating structured private sector and civil society engagement.

The NCCC could also serve as the institutional home for grievance redress, technical advisory committees, and stakeholder consultations functions that are essential for transparency and integrity in a carbon market but are often scattered across agencies or entirely absent.

The Role of the Private Sector and Data Integration

Finally, institutional strengthening must also encompass clear protocols for collaboration with the private sector. The current disconnect between government datasets (e.g., carbon inventories, land-use maps, energy consumption figures) and private project developers leads to inefficiencies, misaligned baselines, and duplicative verification processes. A reformed institutional framework must include:

- Standardized access to government datasets through digital platforms with API integrations;
- Legal mechanisms for public–private data collaboration, especially in MRV and registry functions;
- Guidance for third-party validators and auditors to align their methodologies with national standards;
- The creation of a data valorisation strategy, where verified datasets are monetized, licensed, or co-developed with non-state actors.

One way forward is to establish a centralized carbon data clearinghouse under the NCCC or MoCC&EC that aggregates, standardizes, and curates emissions data, project baselines, and monitoring tools for use across public and private stakeholders.

Pakistan's carbon market will not succeed without a coherent, empowered, and well-coordinated institutional architecture. The most pragmatic path forward lies not in reinventing governance but in upgrading and leveraging what already exists—particularly the REDD+ MRV infrastructure, the capacities of institutions involved, and existing intergovernmental protocols. Institutionalizing these linkages through a dedicated National Carbon Coordination Council, and investing in deep, multi-sectoral technical capacity within the government, will yield systemic dividends and allow Pakistan to build a carbon market that is not only compliant but also equitable, efficient, and credible.

Recommendation 4: Establish Dedicated Technical Training and Capacity Building Programs

One of the most persistent and structural barriers to the development of credible carbon markets in Pakistan is the severe deficit in technical and institutional capacity. Carbon markets operate at the intersection of environmental science, legal regulation, financial valuation, and data governance. These multidimensional domains require a highly skilled workforce, both within the government and across the private sector, to ensure integrity, transparency, and scalability of carbon market projects. The findings of this report show that Pakistan's existing capacity is fragmented, overstretched, and largely confined to a small pool of experts concentrated in isolated donor projects or specific ministries.

To develop a robust carbon market that can attract investment and meet international standards under mechanisms such as Article 6 of the Paris Agreement, Pakistan must treat capacity building not as a side activity but as a central, structural investment in its carbon governance architecture. This includes designing long-term human resource pipelines, institutionalizing training at scale, and creating cross-sectoral technical nodes that can drive knowledge transfer and innovation. Capacity must be embedded not only in climate-focused institutions but across the entire spectrum of sectors such as forestry, energy, agriculture, industry, planning, and finance.

Building Multi-Level, Multi-Disciplinary Capacity in the Public Sector

Within the government, the need is twofold: vertical and horizontal. Vertically, Pakistan requires trained personnel at federal, provincial, and district levels who can understand and implement carbon market operations, such as MRV protocols, benefit-sharing arrangements, registry compliance, and climate finance planning. Horizontally, capacity must be developed across ministries, from the Ministry of Climate Change & Environmental Coordination (MoCC&EC) and the Pakistan Bureau of Statistics (PBS), to the Ministry of Energy, provincial forest departments, and economic planning commissions.

At present, much of the public sector's technical knowledge around MRV systems, Article 6 cooperation, or crediting methodologies is concentrated in isolated teams supported by donors or UN agencies. This knowledge is not mainstreamed into bureaucratic structures, nor is it backed by a system of continuous learning. institutional memory is often lost when key individuals rotate or leave.

Accreditation of Domestic MRV and Verification Institutions

Another critical gap lies in Pakistan's dependence on foreign verifiers and auditors for validation of carbon credits, which not only increases transaction costs but also limits local learning and institutional credibility. In comparison, countries such as South Africa have invested in building domestic accreditation systems such as SANAS (South African National Accreditation System), which provide independent validation and verification while aligning with international standards.

Pakistan must replicate such a model by establishing a national accreditation framework for MRV and third-party verifiers. This can be housed within the Pakistan National Accreditation Council (PNAC), in coordination with MoCC&EC, to license institutions that can provide project validation, baseline verification, and emissions auditing.

A phased plan should be adopted where international partners mentor local institutions to gradually transfer capabilities. Training the next generation of carbon auditors, registry managers, and verifiers must be part of this accreditation pipeline.

Such a shift will not only increase technical trust in domestic carbon credits but will also facilitate local job creation and reduce bottlenecks in project validation. It will further support compliance under emerging international carbon market regulations, including the Carbon Border Adjustment Mechanism (CBAM) in the EU, which demands strict emissions accounting from exporting countries.

Enabling Innovation and Capacity in the Private Sector

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Enabling Innovation and Capacity in the Private Sector

The private sector, especially small and medium enterprises (SMEs) faces a severe information and capacity deficit in navigating the complex regulatory, financial, and technical ecosystem of carbon markets. Many potential project developers, especially in agriculture, waste management, and renewable energy, are unaware of eligibility requirements, monitoring obligations, or financial returns involved in carbon credit generation. This has led to underutilization of market opportunities, especially in rural and sub-provincial contexts.

To address this, the government should develop technical assistance toolkits, including open-source MRV templates, emissions calculation apps, and project design documents, for different sectors. Public-private partnerships can support the development of sector-specific carbon incubators, particularly in universities and chambers of commerce, where entrepreneurs and firms can receive mentoring and technical support.

Furthermore, data access and co-development can be leveraged as a form of capacity building. For instance, MoCC&EC and PBS can make land use, emissions, and energy consumption data

publicly available in machine-readable formats, allowing private developers to build apps, baselines, and monitoring systems atop this data. In addition, pilot project successes such as Delta Blue Carbon, Lakhodair, and Sapphire Wind must be used as live case studies, with embedded learning components to mentor new project developers.

Institutionalizing Talent Pipelines and Technocratic Leadership

One of the more difficult but necessary shifts Pakistan must undertake is to institutionalize climate governance as a specialized technical field, akin to health or finance. Climate change and carbon markets cannot be effectively governed through ad hoc assignments or generalist bureaucratic rotations. Instead, the government must create dedicated climate service cadres or specialized posts that reward domain expertise, long-term specialization, and cross-sectoral skillsets.

This means hiring climatologists, data scientists, MRV auditors, legal analysts, and carbon finance specialists into the public sector on career tracks that reflect their technical training. Public service rules must be updated to accommodate these roles and to foster interagency secondments, international exposure, and continuous upskilling.

Lessons can be drawn from earlier sectoral reforms in Pakistan, such as the telecom or power sectors, where systemic improvements were driven not just by policy change but by technocratic empowerment, human resource development, and sustained private–public collaboration.

Without building technical capacity across public institutions, private actors, and civil society, Pakistan's carbon market will remain underdeveloped, externally dependent, and lacking in credibility. By investing in structured, cross-sectoral capacity development—grounded in systemic reforms, national institutions, and global partnerships—Pakistan can lay the human and institutional foundation for a carbon market that is not only high-integrity, but also resilient, locally owned, and development-oriented.

Recommendation 5: Institutionalize Safeguards, Equity, and Public Participation

As Pakistan ventures into the complex terrain of carbon markets, a key lesson from both international experience and domestic readiness assessments is the critical importance of tempering ambition with realism. Carbon markets are neither quick-fix solutions nor self-executing mechanisms. Their success hinges on an intricate web of regulatory coherence, technical infrastructure, institutional capacity, and trust. Yet, in Pakistan's discourse on carbon markets, spurred by excitement over potential revenues and global visibility, there is often a premature eagerness to leap into advanced regulatory constructs without laying adequate foundational groundwork.

One of the strongest messages emerging from stakeholder consultations and global practice is the need for phased development, anchored in learning-by-doing, and adaptive institutional design. This means building not just with speed, but with strategic patience and clarity of purpose.

Rethinking Ambitions in Light of Systemic Constraints

Multiple stakeholders interviewed for this report cautioned against rushing into fully-fledged compliance carbon markets modelled on complex systems such as the EU Emissions Trading Scheme (EU ETS) or California's cap-and-trade program. As one expert noted, "Carbon markets are not plug-and-play solutions. They demand a sophisticated ecosystem, of monitoring systems, enforcement institutions, legal clarity, and stakeholder trust, that takes years, sometimes decades, to develop." Attempting to import or replicate mature market structures without equivalent groundwork may lead to institutional fatigue, market stagnation, and ultimately, loss of political will.

The case of Brazil offers an instructive parallel. Despite its immense ecological assets and strong international presence in the carbon space, Brazil took more than a decade of dialogue, legal reform, and institutional experimentation before it reached the milestone of formally enacting its Greenhouse Gas Emissions Trading System (SBCE) in 2024. Even now, its full implementation remains a multi-year endeavour. The Brazilian approach was deliberate, marked by iterative consultation, multi-stakeholder input, and capacity development, and serves as a model for adaptive sequencing in market-building.

Pakistan, by contrast, has tended to over-rely on inflated projections such as the oft-cited $5 billion annual revenue potential from carbon credits without aligning them with grounded supply estimates or institutional readiness. This mismatch between ambition and capability risks distorting both policy design and stakeholder expectations.

Prioritizing Market Diagnostics Before Design

The first step in recalibrating Pakistan's carbon market approach is to conduct a rigorous market needs and supply assessment. This should map the emissions profiles of key sectors, such as energy, transport, agriculture, and forestry, alongside abatement costs and marginal abatement potential. Only with this data can an appropriate cap-and-trade or baseline-crediting system be calibrated to reflect actual mitigation opportunities. This assessment must also gauge domestic demand for carbon offsets: which sectors are willing to pay, under what pricing conditions, and how that aligns with international credit demand.

This diagnostic process is not merely technical; it is strategic. It helps policymakers avoid the trap of oversupply which depresses credit prices and market confidence (or over-regulation) which stifles private sector participation. It also allows more grounded sectoral targeting. For instance, agriculture and land use change may offer large-scale sequestration potential, but suffer from MRV limitations, whereas energy sector emissions may be more quantifiable but politically harder to regulate.

Learning from Domestic Experience: The Trophy Hunting Model

Pakistan has already initiated promising pilot projects, such as the Lakhodair Landfill Gas Project, the Sapphire Wind Farm, and the Delta Blue Carbon Mangrove Initiative. These projects serve not only as early carbon finance experiments, but also as testing grounds for regulatory design, MRV protocols, benefit-sharing models, and community engagement.

What is now needed is a formalized mechanism to systematically evaluate these pilots, extract learning, and feed it into future regulatory frameworks. Each pilot should be linked to structured monitoring, including third-party validation, government oversight, and stakeholder feedback loops. Findings from pilot evaluations, such as bottlenecks in credit registration, community disputes, or data validation challenges, should be publicly disclosed and used to adapt guidelines before any national roll-out.

This pilot-driven approach mirrors strategies seen in South Africa, where a phased implementation of its national carbon registry and offset framework allowed for recalibration over time, reducing the risk of systemic failure.

Setting Interim Targets Based on Readiness, Not Aspirations

An adaptive strategy also means acknowledging that institutional maturity and MRV readiness, not just mitigation potential, must guide the pace of market development.

At the same time, Pakistan should establish a comprehensive roadmap for carbon market maturity spanning five to ten years, with clearly defined milestones to guide its development. Key steps would include creating a national registry, issuing domestic carbon standards, onboarding independent verifiers, and enacting legislation to provide a robust legal framework for carbon market operations. To ensure effective implementation, this roadmap should be owned and regularly reviewed by a central coordinating entity.

The success of this effort will hinge on close collaboration among several critical stakeholders. The Ministry of Climate Change would provide overall coordination and policy direction, as well as, ensure alignment with international standards and approve carbon market activities. Private sector developers and investors would drive the project pipeline and bring market activity to life, and independent verifiers would ensure credible measurement, reporting, and verification of emissions reductions. Equally important, provincial environmental and forestry departments must be actively involved, as they oversee local implementation, manage land-use and forestry projects, and facilitate community engagement to ensure projects are locally feasible and socially equitable. By clearly defining roles and responsibilities for these actors, Pakistan can create a structured, accountable, and predictable pathway for its carbon market to mature over the next decade.

Managing Expectations and Communicating with Transparency

One of the softer but equally critical gaps is the lack of realistic communication around Pakistan's carbon market potential. Stakeholders expressed concern that the repeated invocation of large, loosely-grounded revenue projections, such as the $5 billion figure, has created a political and public expectation of windfall gains, potentially undermining trust when actual revenues prove slower or more modest. To manage expectations, Pakistan's institutions should commit to publishing real-time data and grounded revenue projections, perhaps based on modelling of ongoing pilot projects. This could take the form of annual carbon market reports, supplemented by quarterly updates, providing transparent information on project pipelines, credit issuance, revenue generation, and fee allocation.

Such structured communication will not only temper political overreach but also support informed budgeting, community engagement, and international partnerships. Realism must also extend to fee structures, revenue allocation formulas, and benefit-sharing mechanisms, which are likely to evolve with experience. Interviewees noted that initial pricing mechanisms must remain flexible, rather than rigidly embedded in early regulations. Iterative refinement, based on stakeholder input and market trends, is essential to ensure equitable and economically viable outcomes.

Building the Foundation for a Compliance Market

Ultimately, the long-term ambition of a national compliance carbon market is not misplaced, but it must be sequenced with care. A premature shift to a cap-and-trade framework without MRV coverage, legal clarity, or enforcement power would only generate complexity without credibility. Pakistan must focus first on creating the enabling conditions: a robust voluntary market ecosystem, backed by legislation, safeguards, public participation, and credible institutional arrangements.

In time, with stronger MRV systems, cross-sectoral data integration, and experience from pilots, Pakistan can explore compliance instruments tailored to high-emission sectors or subnational entities. Until then, the emphasis must be on learning, trust-building, and laying a durable institutional foundation.

Recommendation 6: Adopt a Phased, Realistic, and Adaptive Strategy

As Pakistan ventures into the complex terrain of carbon markets, a key lesson from both international experience and domestic readiness assessments is the critical importance of tempering ambition with realism. Carbon markets are neither quick-fix solutions nor self-executing mechanisms. Their success hinges on an intricate web of regulatory coherence, technical infrastructure, institutional capacity, and trust. Yet, in Pakistan's discourse on carbon markets, spurred by excitement over potential revenues and global visibility, there is often a premature eagerness to leap into advanced regulatory constructs without laying adequate foundational groundwork.

One of the strongest messages emerging from stakeholder consultations and global practice is the need for phased development, anchored in learning-by-doing, and adaptive institutional design. This means building not just with speed, but with strategic patience and clarity of purpose.

Leveraging Article 6 as a Strategic Entry Point

The most promising avenue for Pakistan to expand its market access lies in Article 6.2 of the Paris Agreement, which allows for the bilateral transfer of emission reductions between countries, governed by formal cooperation agreements. This mechanism not only enables countries to sell carbon credits internationally but also establishes a framework for "corresponding adjustments" to avoid double-counting.

Several developing countries, including Ghana, Thailand, and Senegal, have already begun leveraging Article 6 to attract investment from carbon credit buyers such as Switzerland, Sweden, and Japan. Ghana, for instance, has entered into operational agreements that detail processes for project authorization, MRV, benefit-sharing, and corresponding adjustments, and has publicly disclosed these processes to build trust. Pakistan, by contrast, has yet to move beyond generic signalling. The absence of any signed bilateral Article 6 cooperation agreement not only limits its revenue options but also undermines investor confidence.

To correct this, Pakistan should prioritize negotiating bilateral Article 6.2 agreements with key climate finance partners, such as Japan, Switzerland, Korea, and potentially the UAE, who are actively seeking credible mitigation outcomes from developing countries. These agreements must include detailed annexes outlining procedures for project approval , ITMO issuance, safeguards, and host country authorization. The Ministry of Climate Change & Environmental Coordination should take the lead in overall negotiation strategy and policy alignment, supported by the designated body, which would oversee compliance with UNFCCC requirements and approve projects under the Article 6.2 framework. Provincial environmental departments should be involved in local project validation and implementation, while private sector developers and investors must engage to ensure feasibility and market readiness. . All processes must be transparently communicated to the UNFCCC and disclosed domestically, following best practices established by countries like Ghana and subnational actors like California. Establishing a clear and operational Article 6.2 framework would significantly elevate Pakistan's standing in global carbon markets and attract both public and private sector investments.

Aligning National Guidelines with Emerging Integrity Standards

Credibility in the voluntary carbon market is increasingly shaped by independent global initiatives aimed at improving the environmental and social integrity of carbon credits. Two such initiatives stand out: the ICVCM's Core Carbon Principles (CCPs) and the VCMI's Claims Code of Practice. These frameworks seek to bring consistency, rigor, and trust to the marketplace, especially for corporate buyers under scrutiny from ESG commitments.

Pakistan's 2023 Policy Guidelines for Trading in Carbon Markets make positive overtures toward environmental integrity and community safeguards. However, they fall short of full alignment with the ICVCM's criteria, which include robust additionality, permanence, leakage prevention, and effective stakeholder engagement. Similarly, the guidelines are silent on how private entities in Pakistan can make "high-integrity" carbon claims under the VCMI framework, which could limit their attractiveness to international buyers and ESG-aligned investors.

To address this, MoCC&EC should undertake a comprehensive mapping of its guidelines against the ICVCM and VCMI frameworks, identify gaps, and issue revised or supplementary guidance where needed. This alignment will not only enhance credit quality but also facilitate acceptance by high-standard platforms such as CIX (Singapore), Verra's registry, or the Gold Standard, which are increasingly applying ICVCM benchmarks in credit listing.

Institutionalizing Transparency and Disclosure

One of the key determinants of credibility in carbon market is transparency. Buyers want clarity on how credits are generated, how double counting is avoided, and whether community safeguards are enforced. Ghana's carbon market office, for instance, maintains a public registry of authorized projects, ITMO transactions, and related adjustments. California's system requires the publication of all offset transactions and third-party verification results. These practices are not just bureaucratic; they are central to trust-building.

Pakistan currently lacks any public platform or registry that provides visibility into carbon market transactions, authorizations, or project-level safeguards. This opacity is particularly concerning given growing scrutiny from ESG investors and international climate watchdogs. A priority step, therefore, is to develop a public-facing carbon market registry or disclosure portal, modelled on successful examples like the UNFCCC CDM registry or the California Air Resources Board (CARB) offset project database. Such a system should list all carbon projects, authorizations under Article 6, safeguard compliance reports, and corresponding adjustments made. By combining project-level data, ITMO issuance records, and revenue allocation information, this portal would serve both market actors and civil society, ensuring oversight and reinforcing Pakistan's commitment to high-integrity carbon trading.

Building Diplomatic and Technical Coalitions

Beyond bilateral deals and technical standards, Pakistan also needs to embed itself more deeply in the diplomatic architecture of carbon markets. Countries such as Colombia, Kenya, and Indonesia have benefitted enormously from participating in global forums such as the San José Principles, Article 6 Implementation Partnerships (e.g., Japan's JCM), and the Paris Agreement Article 6 Working Group. These platforms offer not only funding and technical assistance, but also critical political signalling and peer learning opportunities.

Pakistan should proactively seek observer or participant status in these platforms and nominate focal persons from relevant institutions to represent the country. Technical partnerships with multilateral institutions such as the World Bank's Climate Warehouse, ICAT, and the Global Carbon Registry Initiative can also provide pathways for capacity building and market infrastructure development.

Strengthening Buyer Confidence through Legal Clarity

Finally, foreign buyers, whether governments, multilateral banks, or corporations, will not engage in large-scale carbon credit purchases without legal certainty on credit ownership, taxation, and repatriation of revenues. Pakistan's policy framework is still silent on these issues. Clarifying them through a comprehensive carbon market law (as proposed in Recommendation 2), which includes provisions for ITMO authorizations, rights to emission reductions, and revenue sharing, is essential to provide buyers with legal assurances.

In a nutshell, strengthening international linkages is not just about market access; it is about anchoring Pakistan's carbon market within a globally recognized carbon ecosystem. By actively pursuing Article 6.2 agreements, aligning with emerging standards like the ICVCM, disclosing authorization procedures, and embedding itself in multilateral platforms, Pakistan can leapfrog from the periphery to a position of credible influence in the global carbon markets space. This will not only enhance its ability to mobilize finance but also ensure that its carbon assets are traded fairly, transparently, and in a manner consistent with national priorities.

CARBON MARKET DEVELOPMENT CHECKLIST

1. Legal and Regulatory Foundations

- Enact a Comprehensive Carbon Market Law defining:
  - Carbon rights ownership (including land-based, forest, and blue carbon rights).
  - Market scope (compliance and voluntary markets).
  - Project eligibility requirements.
  - Enforcement and penalty mechanisms.
- Clarify institutional mandates between federal, provincial, and local levels in line with constitutional provisions.
- Integrate equity and safeguards clauses in law, including Free, Prior, and Informed Consent (FPIC) for IPLCs.

2. Governance & Institutional Coordination

- Establish a National Carbon Coordination Council (NCCC) with representation from:
  - MoCC&EC, PPIB, Ministry of Finance, PBS, provincial environment departments, sectoral agencies.
  - IPLC representatives, academia, and private sector.
- Develop a carbon market governance roadmap with timelines and responsibilities.
- Create independent grievance redress mechanisms modeled on global best practices.

3. Data, Baselines, and MRV Systems

- Integrate existing data systems (e.g., REDD+ MRV, satellite monitoring, PBS statistics).
- Establish national baselines for priority sectors: forestry, agriculture, energy, transport, coastal ecosystems.
- Ensure all baselines are transparent, accessible, and independently verified.
- Adopt internationally recognized MRV standards (aligned with ICVCM, UNFCCC, Verra).

4. Capacity Building & Accreditation

- Launch a national capacity-building program for:
  - Government officials (emissions accounting, carbon finance).
  - Project developers and community groups (technical and legal training).
  - Domestic verifiers and auditors.
- Partner with universities, UNEP, GGGI, ICAT, and regional centres for training.
- Establish national accreditation for MRV and verification bodies to reduce reliance on foreign verifiers.

CARBON MARKET DEVELOPMENT CHECKLIST

5. Safeguards, Equity & Public Participation

- Identify beneficiaries/IPLCs using vulnerability-based criteria and project zoning principles.
- Mandate transparent, participatory consultations in local languages at early project stages.
- Integrate World Bank Environmental & Social Framework and UNFCCC REDD+ safeguards.
- Require public disclosure of benefit-sharing arrangements, finances, and non-monetary benefits.
- Build IPLC capacity to understand and negotiate carbon market participation.

6. Benefit-Sharing Mechanisms

- Design adaptive benefit-sharing agreements, reviewed regularly with community input.
- Ensure separation from Loss & Damage and other payments to avoid substitution.
- Link benefit-sharing to both monetary and non-monetary benefits (livelihoods, infrastructure, ecosystem services).
- Incorporate lessons from Pakistan's trophy hunting program for transparent revenue sharing.

7. International Alignment & Market Access

- Negotiate Article 6 bilateral agreements with key climate finance partners (Japan, Switzerland, Korea, etc.).
- Align national carbon market framework with:
  - ICVCM Core Carbon Principles.
  - VCMI Claims Code.
  - Global best practices for credit quality and integrity.
- Publicly disclose Article 6 authorizations, adjustments, and credit issuances.

8. Transparency, Compliance & Reporting

- Create a national carbon credit registry with public access.
- Require annual progress and financial reports for all projects.
- Establish independent third-party audits of both MRV and benefit-sharing outcomes.

9. Risk Management & Trust Building

- Monitor market, social, and environmental risks continuously.
- Implement a Feedback & Grievance Redress Mechanism (FGRM) for stakeholders.
- Maintain trust through consistent transparency, especially in data and revenue disclosure.

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