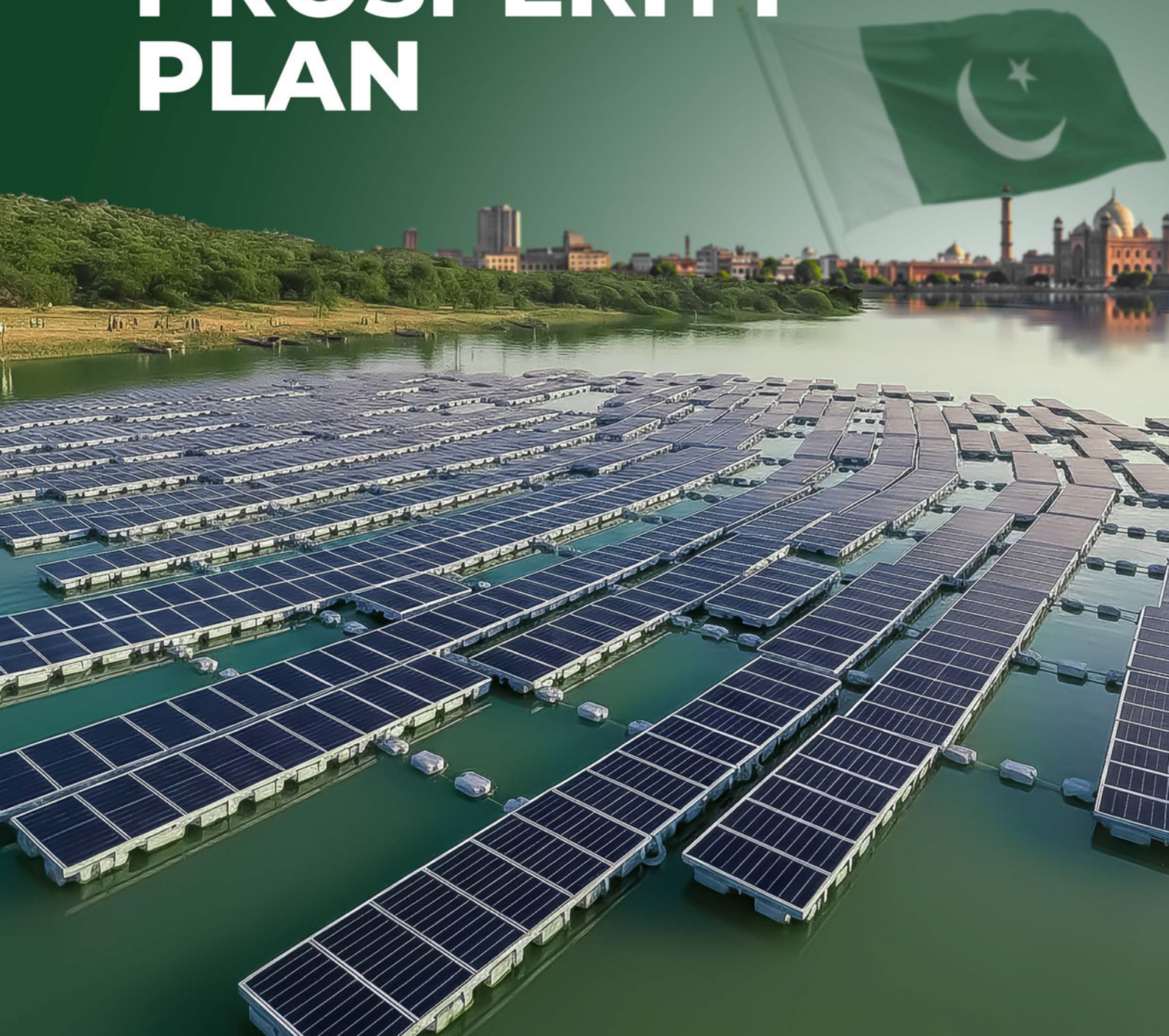
MINISTRY OF FINANCE
GOVERNMENT OF PAKISTAN

CVF V20
CLIMATE VULNERABLE FORUM
VULNERABLE TWENTY GROUP

PAKISTAN CLIMATE PROSPERITY PLAN



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CONTENTS

ACRONYMS

ADB	Asian Development Bank
AF	Adaptation Fund
AKAH	Aga Khan Agency for Habitat
AKRSP	Aga Khan Rural Support Program
AJK	Azad Jammu & Kashmir
AI	Artificial Intelligence
ARR	Afforestation, Reforestation and Revegetation
BAU	Business-As-Usual
BoI	Board of Investment
BPPPA	Balochistan Public–Private Partnership Authority
CAPEX	Capital Expenditure
CBAM	Carbon Border Adjustment Mechanism
CPP	Pakistan Climate Prosperity Plan
CPEC	China-Pakistan Economic Corridor
CR-CBA	Climate Risk–Informed Cost-Benefit Analysis
CRI	Climate Risk Index
CVF-V20	Climate Vulnerable Forum and the Vulnerable Twenty Finance Ministers
DFI	Development Finance Institution
DRR	Disaster Risk Reduction
EIRR	Economic Internal Rate of Return
EPA	Environmental Protection Agency
EV	Electric Vehicle
FX	Foreign Exchange
GB	Gilgit-Baltistan
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEF	Global Environment Facility
GEZs	Green Economic Zones
GEM	Green Economic Model
GHG	Greenhouse Gas
GLOF	Glacial Lake Outburst Flood
GoP	Government of Pakistan
IEA	International Energy Agency
IFI	International Financial Institution
IGCEP	Indicative Generation Capacity Expansion Plan
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
IPPU	Industrial Processes and Product Use

IRR	Internal Rate of Return
ITMO	Internationally Transferred Mitigation Outcomes
KE	K-Electric
KPI	Key Performance Indicator
KPK	Khyber Pakhtunkhwa
L&D	Loss and Damage
LOI	Letter of Intent
MDB	Multilateral Development Bank
MoCC&EC	Ministry of Climate Change and Environmental Coordination
MoF	Ministry of Finance
MoPDSI	Ministry of Planning, Development, and Special Initiatives
MRV	Measurement, Reporting, and Verification
MSME	Micro, Small, and Medium Enterprise
$MtCO_2e$	Metric Tons of Carbon Dioxide Equivalent
NAP	National Adaptation Plan
NBS	Nature-Based Solutions
NBSAPs	National Biodiversity Strategies and Action Plans
NCCP	National Climate Change Policy
NDC	Nationally Determined Contribution
NDMRF	National Disaster Risk Management Fund
NEVP	National Electric Vehicle Policy
NPV	Net Present Value
ODA	Official Development Assistance
PA	Paris Agreement
PCCA	Pakistan Climate Change Authority
PDF	Project Development Facility
PKR	Pakistani Rupee
PMU	Project Management Unit
PPP	Public-Private Partnership
PPAs	Power Purchase Agreements
RE	Renewable Energy
ROI	Return on Investment
SBP	State Bank of Pakistan
SDG	Sustainable Development Goal
SECP	Securities and Exchange Commission of Pakistan
SIFC	Special Investment Facilitation Council
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
WB	World Bank

MESSAGE FROM MR. MUHAMMAD AURANGZEB

Minister for Finance & Revenue

It is my immense pleasure to share Pakistan's first-ever Climate Prosperity Plan (CPP). The launch of the CPP comes at a critical juncture in our nation's climate history. The catastrophic 2022 floods, followed by equally severe 2025 inundation, displaced millions, devastated agricultural heartlands, and inflicted billions in economic losses. They were yet another stark reminder of how climate extremes threaten our fiscal stability and development progress.

Despite contributing less than 1% of global greenhouse gas emissions, Pakistan continues to bear some of the world's most severe climate losses. At the same time, Official Development Assistance (ODA) is shrinking, leaving climate-vulnerable economies like ours with fewer options for concessional finance to address the rising scale of needs. Despite these horrific climate events, Pakistan is determined to face these challenges boldly and has proved to be a climate-responsible country. The enhancement of its climate ambitions through the recently submitted NDC 3.0, where Pakistan has committed to increasing its GHG emission reduction through its own resources from 15% to 17% is a testament to this resolve.

The CPP is not just a policy statement; it is Pakistan's climate investment, technology, and resource plan, aimed to break the cycle of vulnerability and turn climate adversity into resilience and prosperity. By embedding climate resilience at the core of economic planning, the CPP transforms risks into bankable opportunities for renewable energy expansion, resilient agriculture, green industrialization, electric mobility, achieving circularity in the economy, and inclusive financial protection.

It is an evolving and dynamic document, ensuring that future generations inherit a strategy that adapts over time to the advancements in technology and changing needs. It is designed to attract diverse streams of finance, catalyze private capital, and enhance Pakistan's competitiveness in the global green economy.

Government of Pakistan has significantly enhanced its spending on both climate Mitigation and Adaptation projects and introduced budget tagging for its green investments. We have also notified the Sustainable Finance Framework in May 2025 to achieve sustainable development through innovative, targeted, and impact-focused implementation strategies in the social, economic, and environmental spheres. It is an essential step in aligning the national financing strategy with our national sustainability commitments, including NDC 3.0.

As Finance Minister, I call upon our development partners, international financial institutions, and private investors to recognize the urgency and ambition of this Plan. The CPP represents the most credible and transformative pathway for Pakistan to emerge as a leader in climate-smart, inclusive, and sustainable growth.

Finally, I would like to thank the CVF-V20 Secretariat for their invaluable support in developing the Climate Prosperity Plan and to express our commitment to deepening collaboration through shared approaches among CVF-V20 members and enhanced South–South cooperation.

MESSAGE FROM DR. MUSADIK MALIK

Minister for Climate Change & Environmental Coordination

Pakistan stands at a defining threshold, not as a nation asking for rescue, but as one ready to lead.

The floods of 2022 and 2025 reminded us, with painful clarity, that climate change is not a future risk for Pakistan. It is a present reality, measured in displaced families, damaged harvests, and hard-won development reversed overnight. Yet from that experience has emerged not despair, but a sharper sense of purpose.

The Climate Prosperity Plan (CPP) is the expression of that purpose.

Despite contributing less than 1% of global emissions, Pakistan bears some of the most severe climate impacts on earth. We have accepted that reality and chosen to respond with an ambition. Our NDC 3.0 connects climate ambition directly to investment-readiness, through creditworthy project pipelines, carbon market mechanisms, and instruments that attract real, long-term capital.

The Climate Prosperity Plan builds on this foundation, converting vulnerability into economic opportunity across clean energy, climate-smart agriculture, resilient infrastructure, and green industry. As traditional aid and concessional finance continue to decline, the CPP offers a new model anchored in innovation, partnership, and financial reform.

We are proud to advance this work as a member of the CVF-V20, a coalition of 70+ climate-vulnerable nations representing 1.7 billion people, united around a shared agenda of climate prosperity and financial reform. I agree with UNFCCC Executive Secretary Simon Stiell that investing in renewable energy and resilience infrastructure is not government consumption; It is sound economic policy and good risk management. Pakistan's CPP is built on precisely that logic.

To our international partners, we extend both an invitation and a commitment. The CPP is a credible, investable framework and Pakistan is a serious partner. We ask not for assistance, but for collaboration: in mobilizing capital, in reforming the financial architecture that governs access to it, and in building a model that works for climate-vulnerable nations everywhere.

Pakistan's prosperity and global climate progress are, ultimately, the same goal. We look forward to pursuing it together.

I
EXECUTIVE SUMMARY

In Pakistan, climate disasters are no longer rare shocks; they are recurring realities that upend lives, erode livelihoods, and destabilize the economy. From record-breaking floods to scorching heatwaves, GLOFs, cloudbursts and water scarcity, each crisis deepens vulnerabilities and threatens the promise of growth. Yet, within this crisis lies a profound opportunity: to reimagine our path, not as a story of loss, but of resilience. The Pakistan Climate Prosperity Plan (CPP) is born out of this resolve to transform vulnerability into prosperity and build a future for every Pakistani.

The Pakistan Climate Prosperity Plan (CPP) is more than just a fully costed roadmap for low-carbon and climate-resilient development; it is a multi-phase investment and technology access strategy that focuses on the convergence of development, climate, and nature.

The vision of CPP is rooted in Pakistan's commitment to mobilize resources and promote collective action towards shared prosperity. CPP builds upon the foundations of Pakistan's updated Nationally Determined Contributions (NDCs 3.0), URAAN Pakistan, National Adaptation Plan (NAP), and National Biodiversity Strategies and Action Plan (NBSAP). CPP also builds on sector-specific plans, such as the National Electric Vehicle Policy (NEVP-2024), the Indicative Generation Capacity Expansion Plan (IGCEP), and the National Food Security Policy. These frameworks are rooted in CPP ambition, aligning national economic goals with the urgent priorities of resilience, adaptation, and emission reduction.

The CPP sets forth a comprehensive framework to harness Pakistan's vast potential in renewable energy, climate-smart agriculture, resilient infrastructure, nature-based solutions, green industries, electric mobility, access to finance and financial protection for vulnerable populations, serving as a blueprint not only for Pakistan but for other climate-vulnerable economies.

The CPP has three main components.

Green Economic Modeling (GEM-CPP):

A dynamic modeling system integrating climate, nature, and socio-economic outcomes, generating ambitious socio-economic targets.

Initial Value-Adding Projects:

Flagship investments that enhance export competitiveness and leverage regional and global trade opportunities.

Special Investment Mechanisms and Risk Remedies:

A competitive and comprehensive set of special investment strategies to unlock new forms of capital/finance.

Pakistan faces significant climate challenges that require a thoughtful and strategic approach. The Climate Prosperity Plan (CPP), therefore, envisions ambitious yet balanced pathways towards enhancing the country's renewable energy landscape, with aspirations to harness a greater share of sustainable energy

sources by 2040. In addition, the plan emphasizes the importance of safeguarding agricultural land to ensure food security, recognizing the need to adapt farming practices in response to environmental changes.

The targets related to Green Economic Zones demonstrate a commitment to promoting eco-friendly industries and exports, supporting a growth vision aligned with sustainability. Additionally, the CPP aims to enhance the resilience of critical infrastructure and restore vital watersheds, underscoring the importance of a comprehensive climate adaptation strategy. The plan also aims to support long-term circular economic initiatives. This vision of CPP is dedicated to addressing climate vulnerability while encouraging sustainable economic development and promoting collaboration toward a future that balances growth and environmental responsibility.

Integrating ambitious climate policy targets for Pakistan into GEM-CPP modeling reveals a sustainable pathway toward shared climate prosperity. These simulated targets have the potential to promote green growth, reduce climate-related economic losses, and protect livelihoods. Ultimately, this transformation will require an investment of USD 1.6 trillion by 2050. The CPP's investment targets strongly align with URAAN Pakistan and NDCs 3.0, targeting roughly USD 65 billion annually, while NDC's target is USD 56 billion. Investments are projected to reach USD 565.7 billion by 2035, matching NDC forecasts.

The plan recommends delivering the CPP through a Country Platform, led by the Ministry of Finance, in collaboration with the Ministry of Climate Change & Environmental Coordination, the Ministry of Planning, Development, and Special Initiatives, as well as provinces, and supported by the private sector, academia, and civil society. This whole-of-government, programmatic approach aligns national ambition and sub-national action. To provide a running start, the CPP project pipeline includes 69 projects valued at USD 4.87 billion.

The country platform of Pakistan will spearhead:

- Scaling up project pipeline, prioritizing investments that move beyond feasibility studies into bankable execution
- Transactional advisory and attracting early-stage capital to de-risk private investments
- Unlocking new types of finances through lower transaction costs and more responsive financing solutions
- Strengthening of national institutions, including public and private sector institutions
- Improved coordination effort between the federal and provincial governments

In conclusion, the CPP of Pakistan is positioned as the critical lever for securing resilience and growth in the economy, energy, food security, and sustainable long-term prosperity. It offers a pathway to unlock new investments, protect livelihoods, and stabilize the economy against worsening climate shocks.

By pursuing the CPP, Pakistan demonstrates its commitment to converting climate risk into opportunity and positioning itself among the leading climate-smart economies of the future. It will accelerate gender-responsive investments, youth leadership, and locally adaptive solutions as essential drivers of long-term transformation. It will stand on the principle of shared leadership as the government works closely with the people to realize the vision of a better future for all.

II
CLIMATE PROSPERITY PLAN CONTEXT AND VISION

INTRODUCTION

With a population of over 250 million people[1], Pakistan is the fifth-most populous country in the world and covers an area of 881,913 square kilometers. It is a country of immense geographical and economic diversity, spanning fertile plains, high altitude mountain ranges, arid deserts, and an extensive coastline. This strategic location positions Pakistan at the heart of South Asia, Central Asia, and the Middle East, offering significant trade potential and robust economic linkages. Pakistan is administratively divided into four provinces: Punjab, Sindh, Khyber Pakhtunkhwa (KPK), and Balochistan, as well as the federally administered regions of Islamabad, Gilgit-Baltistan, and Azad Jammu & Kashmir. Each province plays a critical role in the national economy. However, Pakistan's geographical and climatic conditions also make it one of the world's most climate-vulnerable nations, facing intensifying climate-related disasters that threaten key economic sectors, including agriculture, energy, infrastructure, and industry.

In recent years, Pakistan has borne the brunt of extreme climate events, with devastating socioeconomic consequences. The 2022 floods submerged one-third of the country, displacing over 33 million people and causing an estimated $30 billion in economic losses, wiping out essential infrastructure and livelihoods.[2,3] Recurring heatwaves and droughts have reduced crop yields, stressed water resources, and disrupted power supplies, driving up costs for industries and households. The 2025 floods also wreaked havoc, costing the economy over $330 million.[4] Glacial melt and flash floods pose an increasingly significant threat to hydropower generation and agricultural irrigation, both of which are vital to Pakistan's economy. Rising sea levels and coastal degradation pose risks to Pakistan's maritime trade hubs, including Karachi and Gwadar, as well as fisheries and local communities.

Climate-induced shocks have imposed enormous fiscal strain on the government, forcing emergency reallocations of resources away from development priorities, such as infrastructure, education, and healthcare, towards disaster recovery and humanitarian assistance. Without a proactive approach to building resilience, Pakistan risks a continued cycle of climate-induced economic setbacks that hinder long-term growth. Recent scientific and economic assessments underscore the need for action. The IPCC's latest reports warn that human-induced climate change is increasing the frequency and intensity of heatwaves, heavy rainfall, and flooding in South Asia, effectively creating a "new normal" of extreme events.[5] The World Bank projects that, under current warming scenarios, Pakistan's annual GDP could be 18-20% lower by 2050 than it would be without climate change[6]. Reduced agricultural productivity, infrastructure damage, water shortages, and health impacts from floods and heatwaves will drive these significant economic losses. Such losses would undermine development gains and strain Pakistan's fiscal stability, as rising expenditures for disaster response and climate-resilient infrastructure compete with investments in education, health, and poverty reduction.

[1] Worldometers
[2] Pakistan Flood Situations
[3] World Bank Report
[4] GDP Target
[5] Climate Risk Index
[6] World Bank Report

Photo credit: Aftermath of a flood in Mingora, Pakistan, August 2025 | Kamran Kami | Shutterstock

Despite these challenges, Pakistan holds significant opportunities for economic transformation. Pakistan has recognized these threats and strengthened its climate commitments in its updated Nationally Determined Contribution (NDC). The 2025 updated NDC pledges an ambitious 50% reduction in projected greenhouse gas emissions by 2030 relative to business-as-usual, with a 17% cut unconditionally and a further 33% conditional on international support.[7]

To achieve this, Pakistan intends to shift to 60% renewable energy by 2030, transition 30% of road vehicles to electric power by 2030, while imposing a moratorium on new coal power plants that require imported coal. Many of these efforts align climate action with Pakistan's development priorities. For example, expanding renewable energy and electricity-powered transportation will considerably reduce emissions as a co-benefit of achieving its priority: improving energy security and dramatically reducing urban air pollution. Likewise, better water management and disaster risk reduction under adaptation programs safeguard agricultural output and public infrastructure, thereby supporting growth and fiscal stability.

To operationalize these goals, Pakistan has developed a suite of enabling climate policy frameworks that collectively establish a regulatory and financial ecosystem for implementation. These include the National Electric Vehicle Policy 2025-30 (NEVP), which sets clear targets for EV penetration (30% of new car sales and 50% of 2- and 3-wheelers by 2030), localization of EV supply chains, and development of charging infrastructure; the 2024 Carbon Market Policy, which outlines the governance structure for international and domestic carbon trading, including the creation of a National Carbon Registry and procedures for ITMO authorization under Article 6 of the Paris Agreement. Furthermore, the Green Taxonomy, published in 2025, guides the classification of green projects, sectoral eligibility, and Do No Significant Harm (DNSH) screening criteria for green finance.

These frameworks serve as foundational policy pillars of Pakistan's transition to a low-carbon, climate-resilient future, ensuring that investments mobilized under the Climate Prosperity Plan are bankable, verifiable, and aligned with national and international sustainability benchmarks.

This Climate Prosperity Plan (CPP) serves as Pakistan's strategic investment blueprint for transforming climate action into a driver of sustainable economic opportunity, inclusive development, and long-term, climate-resilient growth. Its effectiveness and impact are rigorously assessed through the Green Economic Model (GEM-P), ensuring that investments, policies, sector guidance, and interventions are aligned with Pakistan's economic ambitions while strengthening resilience against climate risks.

[7] Pakistan NDC 3.0

PAKISTAN'S CLIMATE AND DEVELOPMENT VISION

Pakistan envisions a climate-resilient, inclusive, and prosperous future where economic development is diversified, value-added and decoupled from environmental degradation. This Climate Prosperity Plan (CPP) reflects Pakistan's commitment to building a competitive, low-carbon, climate-resilient economy by 2050. It aims to safeguard critical sectors and communities from climate shocks while unlocking the potential of renewable energy optimization, green industrialization, clean mobility, resilient agriculture, access to disaster financing and building a circular economy. This includes digital transformation, which will enhance efficiency, transparency, and inclusivity across the targeted sectors.

The CPP aligns with Pakistan's updated Nationally Determined Contribution (NDC), National Adaptation Plan (NAP), National Biodiversity Strategies and Action Plan (NBSAP), and URAAN 2025, setting a strategic direction for a just energy transition, ecosystem protection, and inclusive economic diversification. It aims to create equitable opportunities for the private sector, investors, entrepreneurs, and communities to explore new markets through catalytic capital, blended finance, enabling policy reforms, and capacity-building for green value chains. With one of the youngest populations globally, Pakistan is poised to turn its demographic dividend into a powerhouse for green skills and innovation. A comprehensive and consolidated list of national investment pipelines will help steer decisions and attract long-term financing from both local and international sources.

At the core of this vision is a whole-of-society and whole-of-government approach that elevates climate-smart development at every level, from national reforms to provincial innovation. The CPP recognizes the centrality of the private sector, development partners, civil society and communities in achieving climate prosperity, and emphasizes local solutions, gender-responsive investments, and the empowerment of youth and women as drivers of long-term transformation. This vision is not just a response to climate change; it is a national strategy to build a fairer, stronger, and more climate-resilient and prosperous Pakistan for generations to come.

Photo credit: Wind power plant in Jhimpir, Pakistan, April 2024 | Q World | Shutterstock

III
STRATEGIC OBJECTIVES

BY 2050, PAKISTAN AIMS TO:

Transition to a majority-renewable energy economy that powers industry, households, and transport with clean, affordable energy.

Establish itself as a regional hub for green manufacturing, green investments and value-added exports aligned with global sustainability standards.

Ensure food and water security through climate-resilient agriculture and ecosystem restoration and conservation.

Achieve universal access to climate risk protection through sovereign insurance, resilient infrastructure, adaptive social protection systems and innovative finance.

Reduce poverty and inequality by creating green jobs and improving health outcomes.

Build a circular economy that eliminates waste and reuses materials through closed-loop production, battery recycling, and industrial symbiosis.

Become a net exporter of high-integrity carbon credits through Article 6.2 and 6.4, generating new climate-linked revenue.

Achieve digital climate resilience through AI-driven early warning systems, satellite-based climate analytics, and smart infrastructure.

IV
STRATEGIC FRAMEWORK

Photo credit: Muhammad Ali Jinnah's portrait on Islamabad Highway | Babar Ali / B.A. Photography | Flickr

Photo credit: Solar rooftop installation in Karachi, Pakistan, July 2024 | Hexzain | Shutterstock

Pakistan's CPP is an investment-led framework designed to reposition climate action as a driver of economic growth, resilience, and sustainable development. It provides a clear strategic roadmap for leveraging public and philanthropic support to unlock private investments.

A GREEN INVESTMENT BLUEPRINT FOR CLIMATE-RESILIENT PROSPERITY

At its core, the CPP transforms climate risks into investment opportunities and leverages new business models, capital markets, and south-south cooperation. Through these instruments, Pakistan aims to:

- Unlock new types of capital
- Lower transaction costs
- Catalyze private sector participation
- Expand access to green financing for provinces and communities, including through national development banks, multi-/sub-sovereign wealth investment funds, special purpose vehicles and impact financing.

INTEGRATED NATIONAL-PROVINCIAL APPROACH FOR CLIMATE INVESTMENT

A defining feature of Pakistan's CPP is its commitment to a programmatic, whole-of-government approach towards both climate and development outcomes. The CPP provides a national strategic investment outlay while enabling provincial governments to tailor interventions to local climate vulnerabilities, natural resource endowments, and sectoral priorities.

The sectors under the CPP are identified with the help of climate vulnerability assessments, comprehensive literature reviews, economic impact studies, and wide-ranging consultations with federal, provincial, private sector, academic, development partner, and other critical stakeholders. The sectors included in the CPP represent areas most exposed to climate risks and where investments can deliver the most significant impacts.

The following section presents the sectoral climate investment projects and targets that will operationalize the CPP vision. It will demonstrate how targeted investments can drive tangible outcomes across Pakistan.

V
PRIORITY SECTORS OF PAKISTAN CPP

The CPP envisions a climate-resilient economy by setting highly ambitious targets and projects in priority sectors of Pakistan, including Energy Optimization & Just Transition, EV Industry & Transport, Climate-Resilient Agriculture, Green Economic Zones (GEZs), Climate-Resilient Infrastructure, Financial Protection Mechanisms, Nature-Based Solutions for Protecting Natural Capital, and the Circular Economy.

A. ENERGY OPTIMIZATION AND JUST TRANSITION

GOAL:

Scaling renewable energy for green growth and industrial transformation

TARGET HIGHLIGHTS:

- 60% clean energy share by 2030
- 50% of total electricity generation through increased renewable capacity by 2035
- 95% of total electricity generation from renewable sources by 2040
- Phase out/convert 14,000 MW of Fossil Fuel Plants by 2035
- Reduce transmission and distribution losses from 19% to 8%
- Achieve 100% electricity coverage across Pakistan
- Invest in MSMEs and entrepreneurs to create new jobs and programs for skill building, especially for Solar, Wind and Hydrogen
- Install rooftop solar in 100% of government secondary schools by 2035
- Generate carbon credits equivalent to 200 million tons of carbon emissions annually for revenue generation by 2030

Photo credit: Solar installation in a farm in Malakand, Pakistan, December 2022 | Green Voltaics Energy | Unsplash

Photo credit: Wind power plant in Lahore, Pakistan, January 2021 | Q World | Shutterstock

While Pakistan accounts for only about 1% of total global GHG emissions, and its per-capita emissions (2.3 tonnes of CO_2e per person) remain well below the world average (NDC 2025), its heavy reliance on imported coal and other fossil fuels adds enormous pressure on foreign reserves and a negative impact on balance of payments, while adding to environmental degradation. Volatile global prices and currency risks have driven up generation costs, contributing to soaring consumer tariffs and a circular debt exceeding Rs 1.66 trillion in the power sector[8]. In essence, Pakistan has been paying for expensive capacity it often cannot even fully utilise. Reducing fossil fuel imports by shifting to indigenous renewable energy sources (such as solar, wind, hydro, and local biomass) is seen as vital to easing pressure on foreign exchange reserves and improving energy sovereignty while reducing emissions as a by-product.

A shift towards renewable energy can reduce dependency on costly fuel imports, lower air pollution, decrease greenhouse gas emissions, and lower electricity costs. Investing in large-scale solar and wind farms, energy storage solutions, and grid modernization will enhance energy security while reducing the burden of capacity payments on under-utilized power plants.

At the same time, Pakistan must invest in grid modernisation and storage solutions to enhance the reliability of the grid in the face of cheaper energy alternatives and opportunities in electrifying transportation.

According to an Ember Energy report (April 2025), Pakistan imported 17 GW of solar power systems in 2024, which is twice the amount imported in the previous year, making it the world's third-largest importer of solar panels. This surge is driven by the rising adoption of rooftop solar, as electricity tariffs have increased and panel prices have decreased. Pakistan is uniquely positioned to harness its vast renewable energy potential to drive industrial transformation, enhance energy security, generate carbon credits and achieve long-term climate resilience.

To comprehensively address the country's energy sector debt while freeing up space for cheaper renewable generation, Pakistan must adopt a multipronged strategy that includes the restructuring or renegotiation of high-cost power purchase agreements (PPAs), improved cost-reflective tariffs, and a phased retirement of older, inefficient fossil fuel plants. By accelerating the build-out of lower-cost renewables and reducing capacity payments for underutilized thermal plants, the government can ease the financial burdens that perpetuate circular debt, while also meeting growing electricity demand with cleaner, more affordable sources. Furthermore, introducing transparent auctions for new renewable capacity and enhancing credit guarantees can draw in private investment, creating fiscal headroom to invest in grid upgrades and efficiency measures that underpin a modern power sector.

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[8] Circular Debt

FLAGSHIP PROJECT: FLOATING SOLAR POWER PROJECT - 500 MW (KEENJHAR LAKE, SINDH)

Summary: The project aims to generate clean, renewable electricity to support Pakistan's growing energy needs while reducing reliance on imported fossil fuels. Electricity will be sold to K-Electric under a long-term Power Purchase Agreement (PPA). The project will be implemented through a turnkey EPC (Engineering, Procurement, and Construction) contract, which will be selected through a competitive bidding process. Located near major industrial zones, the project offers strategic value by supplying green energy to high-demand areas.

Project Title	Floating Solar Power Project
Proponents & Structure	Turnkey EPC, PPA with K-Electric
Value Proposition and Market Opportunity	Solar on water avoids land competition, supports KE's renewable shift
Location	Keenjhar Lake, Thatta, Sindh
Policy & Regulatory Context	Solar belt exploitation and grid integration
Business Model & Go-to-Market Strategy	PPA-backed sales to KE; EPC delivery
Current Stage & Implementation Plan or Milestones	LOI secured from KE, EPC under bidding
Key Metrics for Success	861.91 GWh/year, 19.6% CF, IRR 13.94%
Funding Needs	$243.63M

Photo credit: Wind power plant in Jhimpir, Pakistan April 2024 (© World Bank) World Bank

Use of Proceeds	EPC, transmission, O&M
Investment Structure	Debt: $182.72M, Equity: $60.91M
Financial Highlights	IRR 13.94%, tariff 3.98 US¢/kWh
Exit Strategy & Potential	Asset sales or IPP refinancing
SDG Alignment with KPIs	SDGs 7, 9, 13
Job Creation	Construction and technical O&M

Link to all projects related to this sector

Photo credit: Keenjhar Lake in Sindh, Pakistan, October 2020 | A. Savin | Wikipedia

B. CLIMATE RESILIENT AGRICULTURE

GOAL:

Ensure food security and promote sustainable agriculture development

TARGET HIGHLIGHTS:

- Boost agriculture yields by 30% through climate-smart farming techniques by 2030
- Reduce postharvest losses by 20% for wheat, cotton, and rice by 2028
- Double agricultural exports to China & the Gulf region by 2035
- 3X livestock farming exports by 2035
- Reduce water consumption in agriculture by 20% through efficient irrigation, water pricing, intercropping and precision farming by 2030
- Expand agroforestry initiatives to 50,000 hectares to enhance soil and water conservation by 2030
- 50% of perishable exports will be transported through modern cold chain networks by 2035
- Develop Pakistan's first Agricultural Trade Hub at Gwadar Port to serve Gulf and African markets by 2035
- Rootstock innovation on critical horticulture varieties by 2028
- Leverage blue carbon initiatives to create new revenue streams from fisheries conservation efforts
- By 2030, optimize the 30% of the agriculture subsidies (approx PKR 500 billion/year) that are detrimental to biodiversity towards nature-positive outcomes
- Provide climate risk financing tools including index insurance, livestock coverage, and climate-linked loans for 30% of smallholder farmers and agribusinesses across the value chain by 2030

Agriculture is the backbone of Pakistan's economy and society, providing 23.54% of GDP, 80% of export earnings (primarily via textiles), and 42.3% of the labor force is engaged in this sector.[9]

Pakistan has faced repeated climate-induced disasters, for example the catastrophic 2022 and 2025 floods exposed the fragility of Pakistan's food ecosystem. It is important to note that 60% of agricultural GDP is through livestock farming (NAP 2023)

Without urgent adaptation, key crop yields could decline by 14-50% under future climate scenarios (NAP 2023), posing a threat to food security and farmer incomes. Water scarcity poses a profound challenge; agriculture already consumes 95% of Pakistan's freshwater, and unsustainable practices have made water usage inefficient.

[9] Government of Punjab

Photo credit: Farmer tending a rice field in Mehar, Sindh, Pakistan, August 2025 | Mudasir Ali | Pexels

Climate change is expected to further exacerbate its impact on agriculture, and water demand is projected to increase by 60% by 2047 (NAP 2023), while glacial melt and shifting monsoons make water supplies more erratic. Land degradation further undermines productivity in this sector. Furthermore, over one-third of irrigated land is waterlogged or saline, resulting in yield losses of up to 25% (NAP, 2023); meanwhile, fertile farmland is being lost to urban expansion (NAP, 2023).

The National Climate Change Policy (2012, updated 2021), the National Food Security Policy (2018), and the National Adaptation Plan (NAP 2023) identify climate-resilient agriculture as a key pillar for adaptation and development. A climate-resilient agriculture sector will safeguard food supply, protect rural livelihoods, and underpin sustainable economic growth. This means making farms and farmers adaptable to a hotter, more disaster-prone future, growing more food with less water, shielding crops and livestock from floods and droughts, and improving soil and ecosystem health.

Pakistan's National Biodiversity Strategy and Action Plan (NBSAP) aims to reorient and re-purpose subsidies towards nature-positive outcomes. The agricultural sector plays a significant role in emissions, particularly due to the overuse of fertilizers, which is often associated with subsidies. Reforming these subsidies could lower emissions, promote climate-smart agriculture, and enhance access to international climate financing. Reallocating subsidies to sustainable practices would not only fulfill Pakistan's international obligations under the Convention on Biological Diversity (CBD) and NDCs but also facilitate the mobilization of the $74.8 million needed for NBSAP implementation and foster long-term ecological and economic resilience.

Aichi Biodiversity Target 3 and the Global Biodiversity Fund's (GBF) Target 18 aim to identify and reform subsidies by 2025, reducing them by at least $500 billion each year by 2030, while enhancing positive conservation incentives. Agriculture, a significant contributor to deforestation and biodiversity loss, receives over $540 billion annually in global support, with 87% of it being detrimental to nature, indicating a misalignment in fiscal priorities. Pakistan also allocates 500 billion PKR for agricultural subsidies, thereby providing a significant opportunity to transform traditional practices into robust and climate-smart interventions. Given these vulnerabilities, transforming Pakistan's agriculture is an urgent priority.

FLAGSHIP PROJECT: CLIMATE PRECISION AGRICULTURE

Summary: The proposed project presents an integrated set of mechanization solutions intending to improve farm yields & farm economics through the introduction of precision land leveling, precision cultivation & planting, precision based crop surveillance & nutrition, efficient irrigation, contemporary harvesting & grain conservation, scientific post-harvest handling & drying, through mechanized post-harvest management of the farm on land & below the soil surface, transforming farms into climate resilient farms, etc.

Project Title	Climate Precision Agriculture
Proponents & Structure	The structured pay-per-use mechanization model represents a transformative opportunity. By lowering the barrier to entry and enabling access to modern equipment without requiring significant upfront capital, the fund directly addresses a critical gap.
Value Proposition and Market Opportunity	○ Empowerment via free digital access (weather, prices, pest alerts) ○ Climate resilience through regenerative farming ○ Economic uplift: direct market linkages, better yields, bypassing middlemen
Location	Initial focus: Sahiwal & Gujranwala (Punjab); scalable nationwide
Policy & Regulatory Context	○ Aligns with “Digital Pakistan,” NDCs, and Punjab agri-modernization ○ Supports climate adaptation
Business Model & Go-to-Market Strategy	○ The funded farm mechanization suite will be operated under a pay-per-use model where HBL Zarai will provide mechanization services against a service fee charged on a per-acre basis. ○ The Go-to-Market strategy: HBL Zarai will leverage its Dera network, village-level shops, and field teams to aggregate demand, execute services, and collect payments.

Current Stage & Implementation Plan or Milestones	HBL Zarai's team is already operating a fleet of state-of-the-art farm mechanization machinery. HBL Zarai will employ the acquired assets under this project to extend its existing service coverage to farmers. The next stage involves securing investment.
Key Metrics for Success	• Payback in 5-7 years • IRR > 20% • Average annual ROI >15%
Funding Needs	USD 21.5 Million
Use of Proceeds	Acquisition of a whole farm machinery suite (tractors, harvesters, dryers, planters, etc.) with sufficient allocation for repairs and maintenance
Investment Structure	• Mudarib: Independent trustee/fund manager/any designated Islamic financial institution • Rabb-ul-Maal: Fund Investors • SPV/Trustee: An entity to be created or Mudarib may assume the role of SPV/Trustee to hold assets • Operator: HBL Zarai, operating under the Ijarah model, distributes rentals to investors via a mudaraba fund
Financial Highlights	• Pay Back Period: 4.5 years • NPV: Rs. 5.4 billion discounted at 16% based on 10 years of Discounted Cash Flow (DCF) • IRR: 37% • Average Annual ROI: >20% • Cash Flow Snapshot: Annexure-1 • Coverage Acres (Scale of Operations): 10,000 Acres
Cap Table Snapshot	• Mudaraba Fund structure – no fixed equity split • Investors participate via NAV-based units • HBL Zarai acts as an asset operator, not an equity shareholder
Exit Strategy & Potential	The fund can be listed through an IPO or converted into an open-ended NAV-based fund and sold to an asset management company in Pakistan.

Monetized Carbon & Nature Co-Benefits	GHG emission reductions, water conservation, and strengthening food security efforts, poverty alleviation, soil conservation and enrichment, biodiversity preservation, and other related initiatives
SDG Alignment with KPIs	SDG 1, 2, 3, 8, 12, 13
Job Creation	200+ direct and indirect jobs across machinery operators, mechanics, service coordinators, and farmer support staff

Link to all projects related to this sector

Photo credit: Women farmers in Pakistan, April 2024 | thsulemani | Shutterstock

C. GREEN ECONOMIC ZONES (GEZs)

GOAL:

Zero waste zero carbon parks towards green industrialization

TARGET HIGHLIGHTS:

- Pilot one Green Economic Zone by 2026
- Convert 20% of all SEZ into GEZ 2028
- Increase the green certified to 40% of total exports by 2030
- Achieve a 30% circular material use rate in manufacturing by 2030
- Achieve 50% renewable energy share in industrial power consumption by 2035 (Through Captive Renewable Power Plants)
- Improved wastewater management by 25% per unit of production by 2030
- Achieve Carbon Border Adjustment Mechanism (CBAM) compliance for 80% of EU-bound exports by 2028

One of the cornerstones of Pakistan's CPP is the transformation of its industrial sector through green initiatives, which aim to enhance export competitiveness and increase value-added across key sectors.

To achieve “Zero Waste Zero Carbon” parks, there is an opportunity to green existing Special Economic Zones (SEZs), built through public-private partnerships, that integrate low-carbon infrastructure with circular economy solutions. These zones will serve as models of sustainable industrial development, incorporating advanced waste management systems, expanding renewable energy and biofuel options for power and heating, innovative recycling programs, and resource-efficient technologies. Export-oriented sustainability certifications, such as CBAM requirements, create a natural shift toward sustainable practices.

A key focus is ensuring compliance with the CBAM for European exports while simultaneously expanding access to Asian markets. This dual market strategy positions Pakistan to maintain and strengthen its presence in traditional European markets while capitalizing on emerging opportunities in rapidly growing Asian economies.

The Pakistan CPP emphasizes the development of climate-smart manufacturing, particularly in the agricultural, textile, mineral, and technology sectors. This includes the adoption of energy-efficient technologies, implementing water conservation measures, utilizing sustainable production processes, and fostering the development of a circular economy.

Moving forward, the new GEZ will also promote technologies that can help mitigate the spillover effect and facilitate the incorporation of robust circular economy principles. Pakistan faces severe water

scarcity, with per capita water availability dropping to approximately 1,000 cubic meters per year. A recent additional challenge is the rising salinity of water resources, particularly in the southern half of the country. GEZs, as green industrial hubs, would not only need desalinated water but also further strain water resources. Implementing desalination technologies in a GEZ, in line with circular economy principles, can ensure a sustainable industrial and community water supply while minimizing environmental impact.

FLAGSHIP PROJECT: ENHANCING GREEN EXPORT CAPACITY THROUGH GREEN FINANCING

Summary: The project is a USD 615 million blended finance program designed to help Pakistan's key export sectors, including textile, leather, rice, and surgical goods, comply with the upcoming EU Carbon Border Adjustment Mechanism (CBAM) regulations and adopt clean, energy-efficient production methods. EXIM Bank leads the program in partnership with local financial institutions and international climate finance partners. It offers concessional financing and technical assistance to exporters for upgrading technology and switching to renewable energy, helping reduce up to 80 million tonnes of CO_2e over its lifespan. The financial structure includes USD 600 million in lending and USD 15 million in grant support, with funding terms designed to lower borrowing costs and bridge financing gaps.

Project Title	Enhancing Green Export Capacity Through Green Financing
Proponents & Structure	○ Led by EXIM Bank ○ DFI-backed blended finance with grants and concessional debt
Value Proposition and Market Opportunity	Responds to EU CBAM and industrial decarbonization
Location	Nationwide (textile, leather, rice, surgical)
Policy & Regulatory Context	Aligned with Pakistan's 2030 emission reduction goals
Business Model & Go-to-Market Strategy	Loans via PFIs and IFIs; technical support via EXIM

Current Stage & Implementation Plan or Milestones	Structuring phase; stakeholder sessions completed
Key Metrics for Success	80 $MtCO_2e$ avoided; IRR 3.08%
Funding Needs	$615M (loan + grants)
Use of Proceeds	Machinery replacement, clean energy upgrades
Investment Structure	Blended debt model with FX cover
Financial Highlights	NPV: $9.9B; IRR: 3.08%
Exit Strategy & Potential	Debt repayment through industrial returns
Monetized Carbon & Nature Co-Benefits	Carbon reduction and energy savings
SDG Alignment with KPIs	SDG 8, 9, 12, 13
Job Creation	Skilled industrial employment

Link to all projects related to this sector

Photo credit: Shutterstock

D. CLIMATE RESILIENT INFRASTRUCTURE

GOAL:

To strengthen physical infrastructure withstanding intensifying and periodic climate impacts across Pakistan

TARGET HIGHLIGHTS:

- Climate-proof 75% of major national and provincial infrastructure projects by 2040
- Reinforcing and upgrading 70% of existing critical infrastructure in flood and heat-prone districts by 2040
- Develop 25 “Resilient Growth Zones” by 2030 with climate-smart urban infrastructure and early warning systems
- Integrate and implement at the provincial level climate vulnerability screening into all public infrastructure and investment decisions by 2027
- Ensure that all infrastructure investments undergo climate risk assessment and adaptation costing

Climate change poses a significant threat to Pakistan’s expanding urban areas and infrastructure. NAP 2023 reveals that nearly half of the country’s infrastructure is located in high-risk zones vulnerable to climate-related disasters. In recent years, the 2022 floods damaged approximately 13,000 km of roads and 410 bridges. This disruption affected connectivity and economic activities valued at roughly $30 billion.

During the 2025 floods, the situation had gotten worse. Over 1000 lives were lost, and 1-1.8 million people were displaced. Punjab, the largest province and backbone of the country’s agriculture, faced its worst flood ever. Over 2 million hectares of land submerged, 5.1 million people were displaced in 8400 villages, and 300 deaths occurred. Khyber Pakhtunkhwa faced flash floods due to intense rainfall, resulting in 350 deaths. Sindh and Balochistan also suffered, homes, agriculture, and infrastructure suffering heavy damage.

A significant issue is that many infrastructure assets are located in high-hazard areas, such as floodplains and heat-affected districts. These assets are built to outdated standards and without a proper climate risk assessment. This exacerbates the damage caused by climate events. To protect development and mitigate climate-related disasters, Pakistan needs to invest in infrastructure that can withstand future risks, as prevention is often more cost-effective than repair. But this requires a shift from a reactive to a proactive approach to prepare for climate impacts.

More importantly, national highways, river basins, energy transmission systems, ports, and transportation routes (such as CPEC routes) need to be strengthened to withstand climate stress. Urban and rural systems should adopt green infrastructure principles to promote sustainable development.

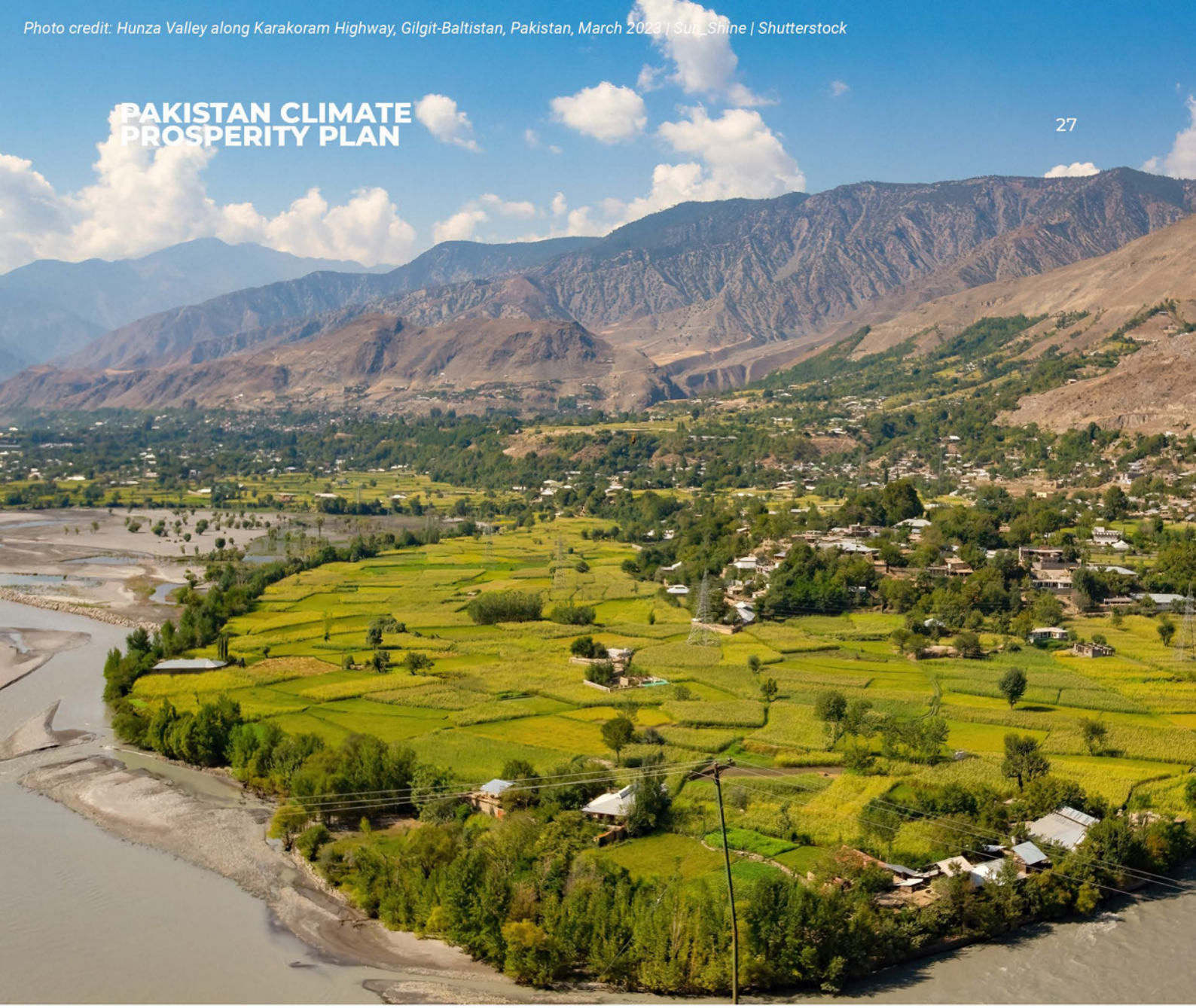

Photo credit: Hunza Valley along Karakoram Highway, Gilgit-Baltistan, Pakistan, March 2023 | Sun_Shine | Shutterstock

These principles include sponge cities, integrated watershed management, nature-based drainage solutions, and building codes that consider extreme temperatures and flooding.

The CPP aims to integrate resilience across sectors by institutionalizing climate risk screening in all major infrastructure financing decisions. For this, tools like climate risk-informed cost-benefit analysis (CR-CBA), disaster risk reduction (DRR) budgeting, and adaptation finance tagging can be used and deployed progressively.

A good example of this is already being practiced in Gilgit-Baltistan, where Aga Khan Agency for Habitat (AKAH) and Aga Khan Rural Support Program (AKRSP), in partnership with the Government of GB, are applying climate risk screening to infrastructure-linked interventions. The model can be replicated at the sub-national level and provides a precedent for integrating resilience in infrastructure design.

Nonetheless, the increasing frequency of climate disasters in Pakistan indicates that its infrastructure is highly vulnerable and unprepared. The CPP thus offers a framework for building resilience across sectors. Investing in climate-resilient infrastructure under the CPP is key to protecting development, saving lives, and ensuring long-term prosperity.

FLAGSHIP PROJECT: REVIVING SUB-VALLEYS: COMMUNITY-LED MICRO-WATERSHED RESTORATION FOR FLOOD RESILIENCE AND LIVELIHOOD SECURITY

Summary: This five-year project (2025–2030) aims to restore 97 micro-watersheds across Khyber Pakhtunkhwa through community-driven watershed rehabilitation, afforestation, climate-smart agroforestry, water harvesting, and eco-enterprise development. It integrates structural and biological measures to reduce flood risks, improve ecosystem services, and strengthen livelihoods.

Project Title	Reviving Sub-Valleys: Community-Led Micro-Watershed Restoration for Flood Resilience and Livelihood Security
Proponents & Structure	○ Proponent: Forest Department, Khyber Pakhtunkhwa ○ Project Structure: Implemented through a Project Management Unit (PMU), divisional offices, and community-based VWCs
Value Proposition and Market Opportunity	The project addresses critical challenges of land degradation, floods, and rural poverty. Restoring micro-watersheds and promoting sustainable livelihoods creates climate-resilient communities and generates eco-business opportunities (beekeeping, poultry, agroforestry, ecotourism). The project enhances water availability, improves food security, and creates local employment opportunities.
Location	Province-wide coverage: Selected valleys in the Micro watershed throughout Khyber Pakhtunkhwa
Policy & Regulatory Context	Aligned with the Khyber Pakhtunkhwa Sustainable Development Strategy (SDS)
Business Model & Go-to-Market Strategy	Community-based model: Formation of 97 VWCs to co-manage restoration efforts, supported by institutional frameworks and digital monitoring. Livelihood activities (forestry, agro-enterprises, eco-tourism) will integrate communities into value chains, ensuring sustainability beyond project life.

Current Stage & Implementation Plan or Milestones	○ Stage: Project design finalized, ready for funding and rollout (2025) ○ Key Milestones • Year 1: Establish nurseries, enclosures, VWCs, and pilot interventions • Years 2-3: Scale afforestation, water conservation structures, agroforestry • Years 4-5: Consolidate livelihoods, visibility campaigns, provincial learning forum
Key Metrics for Success	○ 97 watersheds rehabilitated ○ 1,000+ soil & water conservation structures built ○ 1,500 ha of degraded land restored ○ 39,000+ individuals benefiting directly ○ 97 VWCs established ○ 3,000+ trained in sustainable land management ○ 0+ rainwater harvesting systems installed
Funding Needs	$285 Million (5 years)
Use of Proceeds	○ Afforestation and watershed rehabilitation ○ Engineering & bioengineering flood control measures ○ Community livelihood support and training ○ Establishment of nurseries ○ Capacity building, extension, visibility campaigns ○ PMU operations and monitoring
Investment Structure	Public sector-led with donor financing, implemented via the Forest Department with community participation.
Financial Highlights	○ Total Budget: PKR 80,700 million (2025–2030) ○ Annual phasing from PKR 6,500m (2025–26) to PKR 12,000m (2029–30)
Cap Table Snapshot	Not applicable (public sector project)

Exit Strategy & Potential	○ Sustainability ensured via VWCs, government support, and income-generating activities ○ Knowledge products and visibility campaigns will facilitate replication and scaling across Pakistan
Monetized Carbon & Nature Co-Benefits	○ Afforestation and agroforestry to increase carbon sequestration & generate carbon credits ○ Soil and water conservation improve hydrology and groundwater recharge ○ Biodiversity conservation through habitat restoration
SDG Alignment with KPIs	SDG 1, 2, 5, 6, 12, 13, 15
Job Creation	○ Direct employment for 2,500 households in watershed-based livelihoods ○ Skilled and unskilled labor during the construction & plantation phases ○ Women and youth engagement through nurseries and eco-enterprises

Link to all projects related to this sector

Photo credit: Kalam, Khyber Pakhtunkhwa, Pakistan, July 2022 | Raheel Mughal | Pexels

Photo credit: People standing in knee-deep in flood water in Gandakha City, Balochistan, Pakistan, September 2022 | Kafeel Ahmed | Pexels

E. INCREASING ACCESS TO FINANCIAL PROTECTION MECHANISMS

GOAL:

Achieve universal access to climate and disaster risk protection by building a resilient financial safety net for vulnerable communities, MSMEs, and critical infrastructure

TARGET HIGHLIGHTS:

- Issue Catastrophe Bonds and Green Sukuk by 2027, raising at least $500 million for disaster risk reduction and climate resilience projects
- Establish dedicated Provincial Climate Resilience/Adaptation Funds in all provinces by 2028 for community access
- Engage private-sector financial institutions to launch climate-smart loan programs and insurance products, benefiting at least 2 million MSMEs and farmers by 2030
- Develop and implement comprehensive insurance coverage for 50% of critical public infrastructure, including schools, hospitals, and roads, by 2030
- Work with private sector/microfinancing banks to curate livestock insurance products and ensure 50% penetration by 2035

Pakistan is among the countries most affected by climate extremes. Pakistan was at the very top of the Climate Risk Index (CRI 2025) in 2022. Recurrent floods, droughts, heatwaves, and GLOFs impose heavy costs; ADB (2025) estimates that average annual disaster losses exceed $2 billion.

Currently, close to 44.7% of the population is under the poverty line.[10] Disaster response relies heavily on post-crisis international aid and budget reallocations, which are unsustainable and often non-responsive to immediate needs and specific local contexts. Establishing climate risk financing solutions such as parametric insurance, sovereign insurance, and regional risk pooling mechanisms can thus provide rapid financial relief and strengthen economic resilience. Crop and livestock insurance for farmers, business interruption insurance for MSMEs, and participation in initiatives like the Global Shield Against Climate Risks can ensure prearranged financial support during such climate shocks. These mechanisms will help stabilize Pakistan's economy and reduce reliance on emergency aid.

[10] Pakistan Poverty Line

CURRENT LANDSCAPE OF DISASTER, CROP, AND LIVESTOCK INSURANCE IN PAKISTAN

Despite high climate risks, insurance penetration in Pakistan remains dismal. Overall insurance uptake is under 1% of GDP[11], and the government or households absorb most disaster losses without payout from any insurance (e.g., 2010 floods caused $10 billion in losses with minimal insurance payouts due to low coverage.) During the Climate Prosperity Plan consultations, three innovative financial instruments were identified as key gaps:

- **Disaster Risk Insurance:** Macro-level risk transfer is nascent in Pakistan. Pakistan has no sovereign catastrophe insurance in place yet (no participation in a regional risk pool to date). The government relies on post-disaster budget reallocations and international aid. The state-owned National Insurance Company Limited (NICL) provides insurance for public assets, but only an estimated ~30% of public assets are insured, often just during the construction time frame.[12] It is also pertinent to mention that there is still no inventory of public assets. Thus, most public infrastructure remains financially unprotected.

- **Crop Insurance:** Fewer than 10% of Pakistan's farmers have access to any crop insurance or risk transfer tool. Aside from loan-linked coverage, only small pilot projects have tested index-based crop insurance. For example, weather-index insurance (triggered by rainfall or temperature indices) has been piloted in some areas with donor support and through micro-insurers; however, these pilots need to be scaled up. Currently, there is no large-scale subsidized crop insurance program that reaches the majority of farmers. Given that agriculture is mostly rain-fed in many regions and increasingly climate-stressed, this gap leaves millions of farmers highly vulnerable to crop failure and debt.

- **Livestock Insurance:** Livestock is a critical asset for rural households, yet dedicated livestock insurance remains scarce. Smallholder herders without formal credit have limited access to insurance for livestock losses resulting from disease outbreaks, extreme weather events, or droughts. As climate change raises risks of heat stress, epidemic diseases, and fodder shortages, the lack of livestock insurance is a significant vulnerability for rural livelihoods.

In summary, Pakistan's current risk financing framework heavily skews towards reactive measures (post-disaster relief, ad-hoc aid) rather than pre-arranged insurance or funds. The government has taken initial steps, such as establishing the National Disaster Risk Management Fund (NDRMF) to finance resilience projects, mandating crop and livestock loan insurance, and piloting index insurance; however, coverage remains very low. This underdeveloped landscape provides a strong impetus for the new projects proposed under national plans and the Global Shield.

[11] World Bank 2022
[12] World Bank Report

PAKISTAN'S FINANCIAL PROTECTION STRATEGY UNDER THE GLOBAL SHIELD AGAINST CLIMATE RISK

Pakistan is the first country in Asia to access the Global Shield against Climate Risks. Following a comprehensive in-country process, the Ministry of Climate Change and Environmental Coordination (MoCC&EC), with support from UNDP Pakistan and the V20 Secretariat, has finalized its request for support to scale up pre-arranged finance through the Global Shield in April of 2025.

Launched at COP27 by the Vulnerable Twenty (V20) Group and the Group of Seven (G7), the Global Shield against Climate Risks aims to enhance protection for climate-vulnerable people and countries, contributing to the effective response to loss and damage from climate change. The Global Shield utilizes evidence-based, systematic, and inclusive analyses of countries' protection gaps, applying these analyses to design, fund, and facilitate interventions that address these gaps.

As part of the Global Shield process, workshops and consultations were held across Pakistan, including in the capitals of the four provinces and two regions: Khyber Pakhtunkhwa, Punjab, Sindh, Balochistan, Azad Jammu & Kashmir, and Gilgit-Baltistan. These consultations revealed critical gaps in Pakistan's financial protection, including limited financial instruments to address hazards such as floods, droughts, and glacial melt, which are intensified by the country's geography and topography. The country urgently requires enhanced financial support, risk financing solutions, and technical assistance to develop a comprehensive climate risk management system and strengthen its resilience, as reflected in the support request.

KEY FOCUS AREAS, INTERVENTIONS AND ESTIMATED FUNDING NEEDS OF PAKISTAN'S REQUEST:

- Sovereign Risk Transfer Solutions / Risk-Layering Approach:
  - Develop a national scheme for parametric insurance that addresses multiple hazards to provide quick access to funds as part of a sovereign risk pool
  - Access Catastrophic Risk Bonds/capital market-based financial protection instruments
  - Develop a *National Anticipatory Action Fund* for pre-arranged finance
  - Estimated support needs by Pakistan between 2025-2030: USD 52.5 million

- Agricultural Sector
  - Expanding access to weather-indexed insurance, area-yield indexed insurance
  - Subsidizing premiums for smallholder farmers, especially women and marginalized groups
  - Nationwide roll-out of area-yield index insurance
  - Estimated support needs by Pakistan between 2025-2030: USD 122.5 million

- Public Assets
  - Implement cost-effective financial protection for public assets, covering schools, hospitals, roads, and bridges. Public-private partnerships (PPPs)
  - Focus on ensuring community-based infrastructure
  - Estimated support needs by Pakistan between 2025-2030: USD 30.0 million

- Livelihood Protection (Meso & Micro Level)
  - Scale up conditional cash-transfer programmes for relief during disasters and resilience-building behaviours
  - Integrating forecast-based financing into Pakistan's social protection strategy to improve the timeliness of disbursements
  - Expanding the micro-insurance market to cover the most vulnerable groups in areas such as health, property and life insurance
  - Estimated support needs by Pakistan between 2025-2030: USD 25.0 million

- Risk Analytics
  - Expand multi-hazard vulnerability and risk assessments (MHVRA) to districts that do not have evaluations yet
  - Utilize satellite imagery and geospatial data to monitor climatic patterns for effective disaster risk management
  - Develop predictive climate models for the key sector
  - Strengthening institutional capacity for data collection, risk modelling and disaster risk management to provide timely and accurate information to decision makers
  - Estimated support needed by Pakistan between 2025-2030: USD 15.0 million

With this comprehensive request submitted to the Global Shield financing vehicles, they will determine the appropriate response and package of assistance based on available funding and the remaining pipeline of Global Shield countries. While the initiative's funds will not be sufficient to cover all of Pakistan's financial protection needs, this request plays a critical role in catalyzing broader investment for Pakistan's disaster risk financing strategy as well as accompanying resilience-building measures from additional public and private stakeholders.

Photo credit: Flood in Manjhoo Shori, Balochistan, Pakistan, September 2022 | Kafeel Ahmed | Pexels

FLAGSHIP PROJECT: ACCELERATING LOW-CARBON EMISSION INVESTMENT IN THE MSME SECTOR

Summary: The MSME Low-Carbon Investment Program is a national initiative aimed at accelerating the adoption of low-carbon technologies among micro, small, and medium-sized enterprises (MSMEs) in Pakistan. The program addresses key barriers to green investments by deploying concessional financing, blended capital solutions, risk mitigation instruments, and creating an enabling ecosystem for sustainable MSME growth. It targets environmental sustainability, energy efficiency, and reduced greenhouse gas (GHG) emissions by facilitating access to finance, particularly for underserved MSMEs. The program helps MSMEs transition to clean technologies by addressing critical barriers such as high upfront costs and limited financial inclusion.

Project Title	Accelerating Low-Carbon Emission Investment in the MSME Sector
Proponents & Structure	The Sustainable Finance Department will spearhead the program in conjunction with the core Investment Banking Team of JS Bank Limited (JSBL). Additionally, internal business units, including the SME division and other pertinent departments, will be actively involved in its leadership and execution.
Value Proposition and Market Opportunity	Low-carbon MSME investment framework creates tangible value across Pakistan's industrial, financial, and climate ecosystems - aligning commercial interests with developmental impact
Location	Pakistan
Policy & Regulatory Context	The project aligns with Pakistan's NDCs and the National Climate Change Policy
Business Model & Go-to-Market Strategy	The project will leverage existing financial institutions and emerging MSME lending portfolios. Green projects will be financed at subsidized rates in PKR to align with MSMEs' domestic revenue streams and avoid currency hedging risks. A guarantee facility will be introduced to mitigate high default risk due to a lack of collateral and historical delinquency among MSMEs.

Current Stage & Implementation Plan or Milestones	○ Phase 1: Concept Structuring & Validation Timeline: Months 1-5
	  • Objective: Finalize product design, risk mitigation tools, and partner alignments
	○ Phase 2: Pilot Rollout & Learning Timeline: Months 6-11
	  • Objective: Controlled deployment of green financing products for MSMEs in key sectors and regions
	○ Phase 3: National Scale-Up Timeline: Months 12-24
	  • Objective: Expand geographic reach, optimize delivery mechanisms, and mobilize additional capital to support growth

Funding Needs	Program amount USD 50 Million
Use of Proceeds	The use of proceeds will focus on financing projects aimed at reducing greenhouse gas (GHG) emissions and water consumption, specifically in the following categories: Renewable Energy, Energy Efficiency, Sustainable Water and Waste Management, and Resource Efficiency.
Investment Structure	○ Unsecured facility to JSBL ○ Tenor: Loan up to 5 years ○ Grace Period: will depend on the sub-loans and will be linked with the project implementation period ○ Concessionary rate applicable ○ Currency: PKR
Financial Highlights	The project is currently in the ideation stage and is engaging with multiple stakeholders. Upon completion of this process, the project will obtain access to the relevant data and initiate the financial modelling phase.
Cap Table Snapshot	○ Option 1: PKR equivalent of USD 50,000,000 ○ Option 2: PKR equivalent of USD 25,000,000
Exit Strategy & Potential	The program is structured to ensure a gradual and responsible transition from concessional support to commercially sustainable operations. The primary exit for impact financiers and concessional capital providers will be achieved through the scheduled repayment of sub-loans and the wind-down of guarantee facilities, aligned with the maturity of the underlying MSME financing portfolios.

Monetized Carbon & Nature Co-Benefits	Estimated significant reductions in carbon emissions from the MSME sector, improvements in local air quality, reduced environmental degradation, and contribution to Pakistan's NDC targets
SDG Alignment with KPIs	SDG 6, 8, 9, 12

Link to all projects related to this sector

Photo credit: Shutterstock

F. PROTECTING NATURAL CAPITAL THROUGH NATURE-BASED SOLUTIONS

GOAL:

Safeguard and restore Pakistan's ecosystems as critical climate buffers and economic assets

TARGET HIGHLIGHTS:

- Implement sustainable land management to restore 20% of degraded watersheds by 2030, thereby enhancing water regulation, soil fertility, and carbon sequestration, with the goal of achieving 50% restoration by 2050.
- Increase protected areas to 25% (19.90 million ha) by 2030, thereby halting biodiversity loss in critical ecosystems and maintaining zero net biodiversity loss from 2032 onward.
- Scale up "Recharge Pakistan" to at least 15 sites by 2040 from 6 sites in 2030, restoring wetlands and enhancing aquifer storage in all major watersheds by 2050.
- Restore and protect mangrove coastlines to buffer storms and sea-level rise. Plant 1.5 billion mangrove trees in the Indus Delta by 2030, a 50% increase in mangrove area, and achieve 100% mangrove cover protection by 2050.

Pakistan's climate and economic resilience depend on its natural capital: forests, rangelands, wetlands, coasts, and biodiversity. Yet climate change and environmental degradation are severely straining these resources. The country ranks among the top five globally for biodiversity and ecosystem service loss (NAP 2023), and has only about 5% forest cover, compared to a global average of 31%.

This ecological fragility amplifies climate disasters: glacial melt in the north, shifting monsoons, and rising sea levels in the Indus Delta are exacerbating droughts, salinization, and flood risks (NAP 2023). With 45%[13] of Pakistan's population living in poverty and heavily reliant on natural resources, the poorest communities are most vulnerable to ecosystem degradation. Protecting and restoring natural capital has become an urgent priority to safeguard livelihoods, water and food security, and climate resilience.

Pakistan's economy is underpinned by renewable natural assets; rangelands, forests, fertile soils, and fisheries contribute an estimated 13-15% to per capita wealth (NAP 2023). These ecosystems support agriculture, hydroelectric power generation, and rural livelihoods. However, unsustainable use and pollution have weakened the environmental services they provide. Over 65% of the country's land (rangelands and forests) is overgrazed or deforested, yielding only approximately. 40% of its potential productivity (NAP 2023). In the Indus Plain, intensive farming has led to waterlogged or salinized 4.5

[13] Pakistan Poverty Line

million hectares of cropland (NAP 2023), resulting in reduced yields. Groundwater, which supplies 70–90% of drinking water, is being overdrawn and polluted, thereby undermining a critical drought buffer (NAP 2023). Pakistan is also the world's third most air-polluted country; smog and particulate pollution cut average life expectancies by over 4 years and cost the economy an estimated US$47.8 billion (5.8% of GDP) annually (NAP 2023). Climate change exacerbates these challenges by driving more extreme floods, droughts, wildfires, and heatwaves, which further degrade forests, soils, and wildlife habitats (NAP 2023). In coastal areas, stronger cyclones and erosion threaten mangrove forests and fisheries.

Investing in nature offers a cost-effective, multi-sectoral solution. Healthy ecosystems naturally regulate floods, recharge aquifers, stabilize soils, moderate extreme temperatures, and absorb carbon dioxide. For example, Pakistan's Indus Delta mangroves sequester carbon at 3 - 5 times the rate of terrestrial forests, and the new Blue Carbon initiative could value these mangroves at US$500 million by 2050 if successfully expanded (NAP 2023).

Restoring upstream watersheds will reduce siltation in dams, improve water storage, and protect downstream farms and cities. Cleaner air and urban green spaces will cut healthcare costs and make cities more livable. Every rupee invested in nature-based solutions (NbS) now avoids many rupees in future damages.

ECOTOURISM AS A NATURE-BASED ECONOMIC OPPORTUNITY:

Ecotourism presents a significant untapped opportunity for Pakistan to align environmental conservation with sustainable economic development. With its diverse landscapes, from the snow-capped peaks of the Himalayas and Karakoram to the rich wetlands of the Indus Delta and the coral-rich coastal zones of Balochistan, Pakistan is uniquely positioned to attract nature-based tourism. The travel and tourism sector's total contribution to Pakistan's GDP was 5.9 percent in 2022 and 4.2 million jobs,[14] and this is considered suboptimal considering the diverse tourist sites located across the country.

CPP Pakistan provides ambitious projects to supplement eco tourism as a stepping stone for green investments. A Ski Resort project aims to develop five modern ski resorts in GB (Chilim, Deosai, Babusar, Naltar, Bagrote) with ski lifts, hotels, and supporting tourism infrastructure. The establishment of seasonally reliable ski resorts will expand winter tourism, create jobs, and boost local community income. It requires about PKR 7.67 billion (USD 43M), open to private investors, with an IRR of 26% and payback in 9 years. The resorts are expected to generate PKR 21 billion in net value, create over 1,000 direct and 3,000+ indirect jobs.

Additionally, the Nysa Eco-Resort in Hunza aims to build with local materials, renewable energy, and green design to attract high-end sustainable tourism. The investment is around USD 2.5 million, fully equity-based, with an expected IRR above 30% and payback in ~10 years. It will become a model for green hospitality in Pakistan, reducing emissions while creating local employment opportunities, particularly for women in the hospitality and services sector. The resort also offers potential for future scale-up into a green real-estate or tourism investment trust (REIT).

[14] Economic Impact 2024

FLAGSHIP PROJECT: BALOCHISTAN CARBON OFFSET PROJECT

Summary: A large-scale Afforestation, Reforestation, and Revegetation (ARR) initiative focused on restoring mangrove ecosystems across 34,351 ha in Gwadar and Lasbela districts, Balochistan. The project will sequester 11.2 million tCO2e over 30 years, generate carbon finance, and improve the socio-economic conditions of local communities through green employment, benefit-sharing, and ecosystem restoration.

Project Title	Balochistan Carbon Offset Project
Proponents & Structure	○ Public Partner: BPPPA (Government Agency) ○ Private Partner: To be identified through bidding under the PPP Act 2021 ○ Communities: Beneficiaries and active stakeholders ○ NGOs/CSOs, academia, and investors: Supporting roles
Value Proposition and Market Opportunity	Pakistan's highest poverty rate (71.2% MDPI) and severe mangrove degradation highlight the urgent need for ARR. Project offers climate resilience, improved livelihoods, carbon credit revenues, and alignment with global demand for blue carbon offsets.
Location	Balochistan, Pakistan: Gwadar & Lasbela Districts (Sites: Sonmiani Khor, Kalmat Khor, Jiwani Khor, Sahidi Khor, Sawar Khor, Shabi and Ankara Creeks)
Policy & Regulatory Context	Governed under the Balochistan PPP Act 2021, PPP Policy 2021, and Public Procurement Rules. Environmental approvals through the Balochistan EPA
Business Model & Go-to-Market Strategy	PPP model: Private partner mobilizes equity-based funding, develops projects, and generates carbon credits. Revenue from credit sales will fund benefit-sharing and reinvestment into communities. Credits expected post year 5.
Current Stage & Implementation Plan or Milestones	Pre-feasibility completed. PDD development (6 months), bidding for private partner, FPIC acquisition, MRV plan, and EIA/IEE submission. Project start: Aug 2026. Duration: 30 years. Plantation in two phases (19,747 ha + 14,604 ha).

Key Metrics for Success	○ 11.2 million tCO_2e sequestered (30 years) ○ 392,975 tCO_2e annually ○ 34,351 ha restored ○ Green jobs created ○ Revenue reinvested in health, education, and livelihoods ○ FPIC secured
Funding Needs	USD 30 million project development cost. Private partner to mobilize funds via equity (no debt/loan).
Use of Proceeds	Plantation and nursery management, monitoring & verification, community benefit-sharing, training, socio-economic infrastructure
Investment Structure	Public-Private Partnership model. Concessionaire selected through competitive bidding
Financial Highlights	Pre-feasibility confirms viability. Project designed for 30 years with robust revenue generation from carbon credits starting year.
Exit Strategy & Potential	Long-term revenue from carbon credit sales (VCS/Gold Standard methodologies under consideration). The project offers a scalable ARR model replicable in other coastal regions of Pakistan.
Monetized Carbon & Nature Co-Benefits	Sequestration potential: 11,229,218 tCO_2e (30 years). Nature co-benefits: Biodiversity restoration, improved fish stock, soil stabilization, climate adaptation, and enhanced marine/coastal ecosystems.
SDG Alignment with KPIs	SDG 1, 2, 3, 5, 8, 13, 14, 15, 17
Job Creation	○ Direct: Green jobs in plantation, nursery management, and monitoring. ○ Indirect: Livelihood diversification (mangrove honey, seaweed farming, handicrafts). Women's empowerment through alternative livelihoods and capacity-building.

Link to all projects related to this sector

Photo credit: Busy street in Rawalpindi, Pakistan, September 2021 | Sun_Shine | Shutterstock

G. EV INDUSTRY & TRANSPORT

GOAL:

Promote pakistan clean mobility revolution and energy security through local EV industry development

TARGET HIGHLIGHTS:

- Achieve 30% electric share in new four-wheeler sales by 2030 (rising to 90% by 2040)
- Convert 50% of all new two- and three-wheeler sales to electric by 2030 (rising to 100% by 2040)
- Attain 50% electric share in new public bus sales by 2030 (rising to 100% by 2035)
- 50% of public transport fleets in 5 major cities to be converted to electric buses
- Reduce transport sector oil import burden and related emissions in line with Pakistan's NDC, cutting costly fuel imports by billions of dollars annually
- Establish dedicated EV manufacturing zones and charging networks and at least one EV industrial zone in each province (with end-to-end local EV assembly capabilities) by 2028
- 50% coverage nationwide in major cities for charging infrastructure, including fast chargers and battery swapping stations by 2035, 100% coverage by 2040

Pakistan's rapidly growing transport sector is expanding at double-digit rates as it attempts to keep pace with rapid urbanization and population growth. It is almost entirely reliant on imported oil. This reliance drains about $14-15[15] billion in foreign exchange each year from fuel imports, making oil Pakistan's largest import commodity. Without intervention, rising vehicle use is expected to significantly increase the import bill in the coming years, exacerbating economic stresses, including considerable health and infrastructure expenses due to urban air pollution. Transport also contributes roughly a quarter of Pakistan's greenhouse gas emissions. Electrifying transportation is therefore a strategic priority to help safeguard the country's foreign exchange reserves, protect Pakistan from volatility, increase efficiencies in urban public transport, dramatically curb smog and worsening air pollution in cities, increase the

[15] Pakistan Business Council

health of families working in cities, especially students, reduce spending on public pulmonary health, reduce oil consumption, create new industrial and job opportunities and spur MSME innovation, and, as a co-benefit, drastically reduce the sector's considerable carbon emissions.

In its updated Nationally Determined Contribution (NDC 3.0) and National Electric Vehicle Policy 2024 (NEVP), Pakistan has set ambitious EV adoption targets; notably 30% of new vehicle sales to be electric by 2030, including 50% of two and three-wheelers and 30% of four-wheelers and buses (NEVP 2024). Two and three-wheelers are a critical focus as Pakistan has an estimated 10 million motorbikes, which alone consume about $6-8 billion in fuel annually. Converting these to electric can pay back the upfront cost within 3 - 4 months through fuel savings, while saving billions in foreign exchange each year. Similarly, electric rickshaws and buses will significantly reduce fuel and maintenance costs, making urban transportation cleaner and more affordable. By electrifying urban mobility, Pakistan can improve public health and cut greenhouse gas emissions.

Electrifying transport will strengthen Pakistan's energy security and industrial base. The NEVP 2024 and Pakistan Climate Prosperity Plan also envisions developing EV-focused supply chains, establishing at least one EV-dedicated industrial zone in each province, and mainstreaming battery manufacturing and recycling infrastructure. Integrating local auto part suppliers into the EV value chain will create green jobs and build technical expertise. Transitioning to EVs makes economic sense for consumers and businesses due to lower operating and maintenance costs. By 2030, reduced fuel imports, lower health costs from pollution, and a new green industry could save billions of dollars annually.

Additionally, Pakistan aims to leverage its EV transition for carbon credit generation, creating opportunities to monetize emission reductions through international carbon markets and finance further clean mobility initiatives. To accelerate this transformation, the National Electric Vehicle Policy 2024 mandates special incentives, including reduced electricity tariffs, tax relief, and viability gap funding for EV infrastructure. The government has lowered the electricity tariff for EV charging stations from PKR 71 per unit to PKR 39.70 per unit, reducing EV charging costs by 44%. Alongside this, the NEVP 2024 outlines a comprehensive regulatory framework for setting up EV charging stations and battery swapping infrastructure, aiming to expand the EV ecosystem and encourage private sector participation.

Pakistan is also optimizing its power system by prioritizing domestic renewable energy resources, reducing system inefficiencies, and integrating EV charging infrastructure with clean energy grids. The NEVP 2024 specifically encourages the co-location of EV charging infrastructure with renewable energy generation, including solar and hybrid systems, to enhance sustainability. Efforts to reduce line losses, improve grid management, and decentralize energy production through distributed solar and hybrid microgrids will enhance energy affordability and reliability for both urban and rural communities. Furthermore, by aligning renewable energy-powered EV infrastructure with carbon credit frameworks, Pakistan can generate tradable carbon offsets, attract climate finance, and strengthen its position in global carbon markets.

[16] EV Charging Station

Photo credit: AI-generated image of a car factory referencing solar electric car from Economia | freepik

FLAGSHIP PROJECT: ECONOMIA - SOLAR ELECTRIC VEHICLES & RETROFITTING KITS MANUFACTURING PROJECT

Summary: Economia aims to establish a large-scale manufacturing setup for solar-powered electric vehicles (SEVs) and retrofitting kits (PMDC motors and Li-ion batteries) in Pakistan. The initiative reduces reliance on fossil fuels, addresses rising oil import costs, lowers public transport expenses, and provides environmentally friendly alternatives. Vehicles can self-generate ~50 km/day via solar energy, recover ~20 km through kinetic energy, and hold ~100 km of basic storage (extendable with additional batteries). The project plans to produce 150 vehicles/week in Phase 1, scaling up to 100 vehicles/day within one year.

Project Title	Economia Solar Electric Vehicles & Retrofitting Kits Manufacturing Project
Proponents & Structure	○ Proponent: AGECO (Pvt.) Ltd., a family-owned company registered with SECP ○ Equity structure: 100% equity, privately held
Value Proposition and Market Opportunity	○ Competitive pricing: half the cost of imported EVs from China ○ Target market: middle-income small car owners, ride-hailing drivers, motorbike users, and government institutions (Defense Forces, Police, NADRA, PTCL, Rescue 1122) ○ Market size: 7 million vehicles replacement demand in Pakistan ○ Market note: Government survey cites a replacement demand of ~7 million vehicles nationally, while another dataset notes ~700,000 passenger cars on the road (60% ≤1000cc). Both figures highlight the large-scale opportunity. ○ Affordability: Opportunity for retrofitting existing vehicles with affordable kits
Location	Industrial Zone, Rawalpindi/Islamabad (Kahuta Triangle, Humak)

Policy & Regulatory Context	NEVP
Business Model & Go-to-Market Strategy	○ Technology: PMDC motors, Li-ion batteries, solar panels, controllers ○ Products: Four SEV variants + retrofitting kits ○ Distribution: dealer networks in major cities, financing options via banks and leasing firms ○ Long-term plan: Localize production of motors and batteries to reduce reliance on imports
Current Stage & Implementation Plan or Milestones	○ Completed feasibility studies and prototypes ○ Prototypes displayed at exhibitions and reportedly in limited use by defense organizations ○ Key milestones after funding: • Month 2: Land acquisition and hiring a strategic team • Month 6: Plant construction, hire management staff • Month 8: Machinery installation, staff training • Month 10: First vehicle production, marketing & distribution setup • Month 12: Full operational cycle, 100% capacity production
Key Metrics for Success	○ Production capacity utilization ○ Average downtime reduction ○ Throughput ratio (vehicles/week) ○ Safety incidents per employee ○ Inventory turns ○ EBITDA margins
Funding Needs	○ The initial equity investment is USD 20 million ○ Additional USD 200 million (expansion to 100 vehicles/day)
Use of Proceeds	○ Land & infrastructure: USD 2 million ○ Building construction: USD 2 million ○ Machinery: USD 1.5 million ○ Power generation (500kW solar system): USD 0.5 million ○ Inventory & working capital: USD 14 million

Investment Structure	○ 100% equity investment in USD ○ Open to impact investors, private equity, venture capital, strategic and industrial investors
Financial Highlights	○ IRR: ~59% ○ Payback: ~20 months ○ Breakeven: within 2 years
Exit Strategy & Potential	○ Investors exit through IPO, strategic sale, or acquisition by large EV/automotive companies ○ High-growth market with scaling potential in the regional EV sector
Monetized Carbon & Nature Co-Benefits	○ Reduced CO_2 emissions from fossil fuel replacement ○ Carbon credit monetization is possible through the avoidance of emissions ○ Further quantification of avoided emissions (tCO_2/year) is recommended for investor review ○ Reduction in the national oil import bill
SDG Alignment with KPIs	SDG 7, 9, 11, 13
Job Creation	○ Estimated: 500+ jobs in early phases, with significant indirect job creation in supply chain & service networks ○ 30% women inclusion target

Link to all projects related to this sector

Photo credit: AI-generated image of a car factory referencing solar electric van from Economia | Freepik

H. BUILDING CIRCULAR ECONOMY

GOAL:

Transition Pakistan towards a circular economy that maximizes resource efficiency, eliminates waste, and converts outputs into inputs for new value streams

TARGET HIGHLIGHTS:

- Pakistan to become a zero-waste economy by 2050
- Equip all major cities with functional wastewater treatment and recycling plants by 2030
- Install 50-100 MW of waste-to-energy capacity by 2030 (with at least one major plant in each large city), aiming to reach 300 MW by 2040
- By 2027, establish Pakistan's first industrial-scale lithium-ion battery recycling facility
- By 2030, ensure at least 30% of end-of-life EV batteries and e-waste are collected and recycled, rising to 75% by 2040 and approaching nearly 100% by 2050

Pakistan's transition to a climate-resilient, resource-efficient economy depends on rethinking how materials, water, and energy are utilized and recycled across various sectors. With a rapidly growing urban population, expanding industrial base, and mounting environmental pressures, the current linear model of "take-make-dispose" is unsustainable. A circular economy offers a strategic and systemic solution to reduce waste, extend the lifecycles of resources, and transform environmental burdens into economic opportunities.

CPP Pakistan offers ambitious projects to support the development of a circular economy, marking a significant step forward in green investments. A project by Biowaste Energy Ventures Ltd. (BEVL) aims to convert organic waste into biomethane, pellets, and compost, replacing imported RLNG and reducing methane emissions. The investment is around USD 8 million, with a business model based on daily waste collection and the sale of clean fuel and byproducts. It is expected to avoid up to 491,000 tons of CO_2e annually, provide cost savings of about PKR 300,000 per farmer each year, and strengthen Pakistan's circular economy.

Additionally, the Textile Waste Recycling project aims to recycle 270,000 tons of textile waste annually into rugs, cushions, and other products for 95% of export markets. It requires approximately USD 20 million, with support from the government and donors, and offers a net economic return of 20-40% with a payback period of 4 years.

Photo credit: Freepik

FLAGSHIP PROJECT: PUNJAB RECYCLING PARKS PACKAGE

Summary: The Punjab Recycling Parks Package proposes the development of 10 integrated recycling and waste-to-resource plants across Punjab, each with a capacity of 500 TPD, collectively processing 5,000 TPD MSW. The initiative introduces a PPP + EPC (BOOT model) to ensure efficient recovery of resources, significant GHG reductions, and long-term sustainability.

Project Title	Punjab Recycling Parks Package
Proponents & Structure	Proponents: Government of Punjab, Waste Management Companies, private investors/EPC contractors
Value Proposition and Market Opportunity	This package aims for a ≥70% recovery rate at a 5,000 TPD facility. Extension of landfill life by decades, circular economy acceleration, and direct contribution to Pakistan's COP30 and Paris Agreement commitments
Location	Punjab Province, Pakistan
Policy & Regulatory Context	Supported by the Punjab Government's solid waste management policies
Business Model & Go-to-Market Strategy	○ BOOT model with 20–25 year concession agreements ○ Guaranteed waste supply from local waste management companies ○ Multiple revenue streams include the sale of recyclables, bio-CNG, RDF, compost, and carbon credits
Current Stage & Implementation Plan or Milestones	○ Concept and prefeasibility complete ○ COP30 investor roadshow for capital mobilization ○ Year 1–2: Financial closure and construction of the first 2–3 plants ○ Year 3–5: Rollout of remaining plants, achieving 5,000 TPD processing

Key Metrics for Success	○ 5,000 TPD MSW diverted from landfill ○ 70%+ recovery rate ○ 770,000–970,000 tCO_2e GHG reductions annually
Funding Needs	○ Total CAPEX required: USD 250-350M ○ Per plant CAPEX: USD 25-35M
Investment Structure	○ PPP + EPC BOOT model ○ Land and waste are guaranteed by the government ○ Revenue sharing through product sales and carbon credits ○ Private Sector Investors/EPCs: 70–80% equity ○ Climate/Impact Funds & DFIs: 20–30% equity + concessional debt
Financial Highlights	○ Single Plant Revenues: USD 7.5–9.5M/year ○ Package Revenues: USD 75–95M/year (excluding carbon) ○ Carbon Credits: USD 10–20M/year ○ Combined: USD 85–115M/year ○ IRR: 14–18% ○ Payback: 6–8 years
Exit Strategy & Potential	○ Concession transfer to the government at maturity (20–25 years). ○ Extension of O&M with revised terms. ○ Option to refinance or divest via secondary market in mid-term (years 7-10).
Monetized Carbon & Nature Co-Benefits	○ Carbon: 770,000–970,000 tCO_2e/year reductions, monetizable via compliance and voluntary markets ○ Nature: reduced landfill pollution, improved soil quality via compost, reduced fossil fuel use via RDF and bio-CNG
SDG Alignment with KPIs	SDG 7, 11, 12, 13
Job Creation	An estimated 300-400 direct jobs per plant

Link to all projects related to this sector

VI
IMPLEMENTATION FRAMEWORK


Photo credit: Aerial view of Lahore, Pakistan, March 2020 | Murtaza Ali | Freepik

A. COUNTRY PLATFORM PAKISTAN

A FEDERALLY-LED INVESTMENT MOBILIZATION PLATFORM ANCHORED IN PROVINCIAL DELIVERY

To implement Pakistan's CPP effectively, a national investment, technology, and resource mobilization platform will be established as the institutional mechanism to provide a running start for implementing its projects, unlock climate-aligned capital, and drive coordinated implementation across all levels of government.

The Pakistan Country Platform represents a shift from fragmented projects to dynamic, programmatic approaches that are country-owned and responsive to local needs. This includes investing in human capital, project preparation, early-stage capital, first-loss protection, and guarantees, as well as strengthening national institutions. Effective coordination across government entities, policy reform, and private sector participation are equally critical to unlock green investment and deliver resilient infrastructure and services. In parallel, all CPP projects will be guided by core sustainability principles to ensure long-term environmental integrity and resource efficiency. The Country Platform will serve as the central delivery mechanism to build on the principles of circularity, responsible production, extended producer responsibility, and environmental stewardship across every sector and investment stream. This ensures that sustainability is not a standalone component, but a cross-cutting mandate integrated into project design, financing, and implementation nationwide.

This federally led, multi-stakeholder platform will be spearheaded by the Ministry of Finance (MoF), the Ministry of Climate Change and Environmental Coordination (MoCC&EC), the Ministry of Planning, Development, and Special Initiatives (MoPDSI), provinces, the private sector, and other critical stakeholders. The Pakistan country platform will drive strategic development, engagement & partnerships, mobilize capital for climate/development action, and strengthen resilience & sustainability, while enabling a provincial-led delivery model in line with Pakistan's devolved governance system.

At its core, the platform recognizes the autonomy and central role of provincial governments in designing and implementing climate-resilient infrastructure and development programs. Provincial authorities will lead the implementation of CPP, aligning it with localized needs and natural resource endowments. At the same time, the federal institutions will ensure national coherence, intergovernmental coordination, and access to international finance.

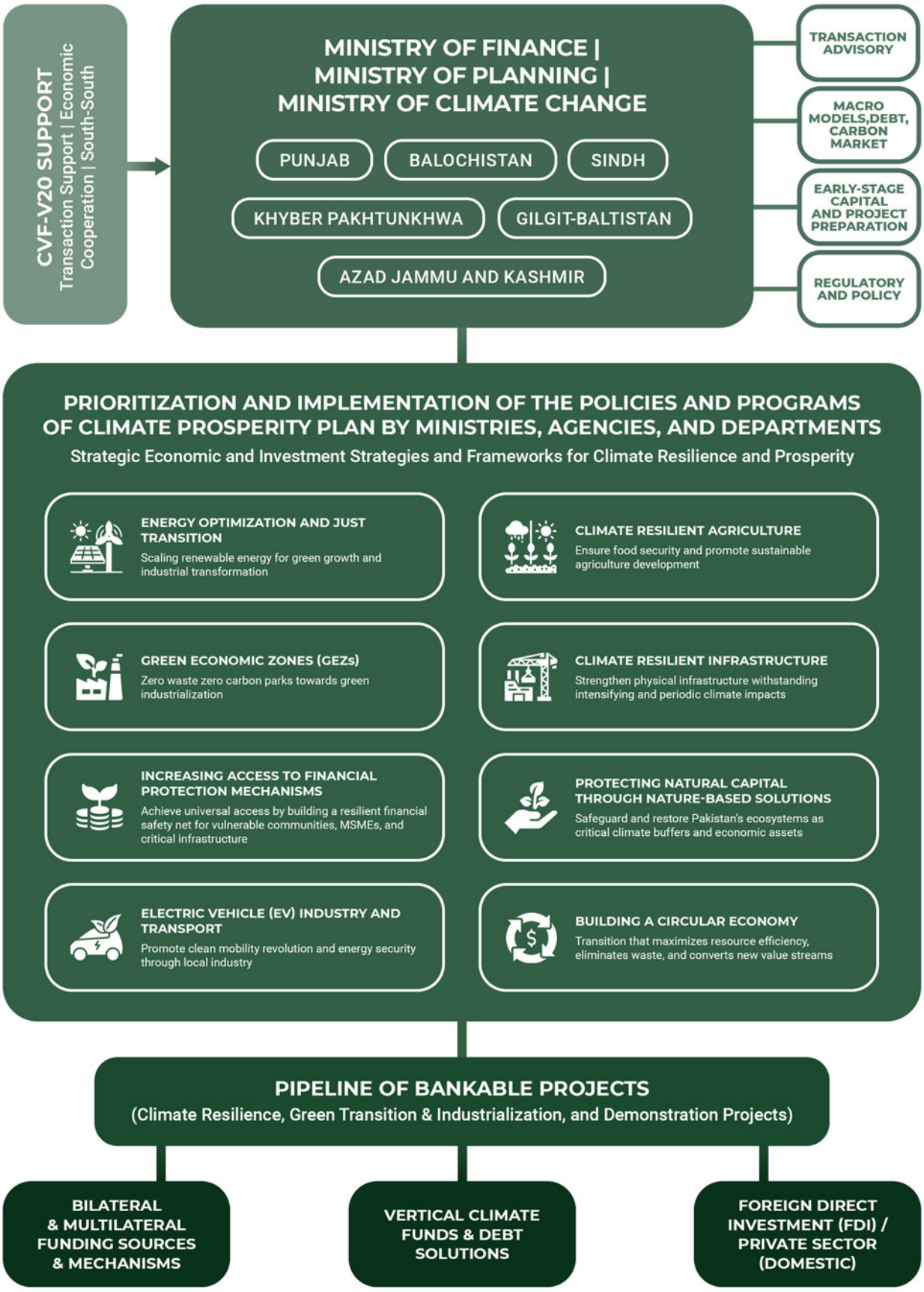

Figure 1. Pakistan Country Platform

B. INSTITUTIONAL ARCHITECTURE AND FUNCTIONS

The Platform will be organized around five core functions, designed to integrate federal coordination with sub-national delivery:

a. Investment Structuring and Pipeline Aggregation

The MoF will lead the development of standardized templates, investment frameworks, and de-risking instruments to support provincial governments in structuring and bundling climate projects. The platform will facilitate the preparation of investment-ready pipelines, including green bonds, blended finance facilities, impact financing options, and carbon market-linked instruments. The MoF will also lead stakeholders and guide with any engagement as it relates to MDBs, Donors, and Credit Rating Agencies, as needed, via the designated Project Development Facility (PDF). The platform will maintain public oversight and accountability through the development of a public online PPP portal, which will feature project documents, timelines, status updates, and investment opportunities.

b. Provincial Financing Enablement and SPV Support

Provincial governments will anchor implementation through Special Purpose Vehicles (SPVs), which will be established to manage project execution, access green finance, and interface with development partners. The platform will assist provinces in establishing and funding Special Purpose Vehicles (SPVs), issuing green bonds, and utilizing the borrowing capacity within the constraints and conditions set by the federal government, as well as those specified by the National Economic Council in accordance with Article 167(4) of the Constitution. SPVs provide a legally and financially ring-fenced platform for bundling climate-related projects, accessing blended finance, and streamlining implementation. Designed with financial and operational autonomy, these vehicles can raise capital independently, receive international and domestic green finance, and coordinate directly with federal entities and development partners.

c. Finance Matchmaking and Donor Coordination

The platform will act as a climate investment dock, a centralized venue where provincial pipelines are matched with public and private financiers. The MoF, with support from the MoPDSI and MOCC&EC, will lead engagement with MDBs, climate funds, philanthropies, and institutional investors to align resources with provincial priorities. The aim is to improve FX risk mitigation (e.g., through local currency bonds or guarantees).

d. Climate Finance Unit within the Ministry of Finance

An existing unit or a newly established division within the MoF will receive capacity-acceleration support from the CVF-V20 Secretariat to enhance the government's capabilities in climate finance analytics and advisory. This division will drive evidence-based decision-making through economic modeling (e.g., GEM-CPP), risk analysis, and results tracking.

e. Capacity Building and Systems Strengthening

Through the platform, the federal and provincial governments will deliver targeted training and capacity-building programs for provincial finance departments, line ministries, local banks, and the private sector. The goal is to enhance green finance literacy, promote access to climate finance mechanisms, and embed fiduciary readiness across all levels of government.

SUMMARY OF PAKISTAN COUNTRY PLATFORM

Development of a centralized project preparation facility to prepare, structure and bundle climate investment projects.

The platform will pave the way for equitable, just, and inclusive stakeholder engagement and capacity building.

The provincial-federal coordination will be strengthened with initiatives such as Special Purpose Vehicles that will manage project execution, green finance, and interface.

Platforms will provide the Partners a single window to co-fund and co-develop climate investment project pipelines.

The platform will improve foreign exchange risk mitigation (e.g., through local currency bonds or guarantees).

The platform will maintain public oversight and accountability with the development of a public online PPP portal entailing project documents, timelines, status, and investment opportunities.

VII
PAKISTAN'S DEBT LANDSCAPE

Photo credit: Traditional farming in Lahore, Punjab, Pakistan, January 2023 | Dr. Photographer | Pexels

CURRENT DEBT LEVELS (FY 2025)

Pakistan's public debt is a significant challenge. Recently, there have been efforts and fiscal structural reforms aimed at stabilizing its trajectory. According to the recent Economic Survey of Pakistan 2024-25, total public and publicly guaranteed (PPG) debt reached PKR 76.007 trillion, approximately $267.64 billion (using an exchange rate of 1 USD = 284 PKR as of August 2025). This represents around 64.5-66.5% of the GDP.[17]

Domestic debt, out of this total, accounts for PKR 51.518 trillion (roughly $181.38 billion), representing about 67.8% of the total public debt, while external public debt is around PKR 24.489 trillion (approximately $86.20 billion). These figures solely focus on federal debt and exclude publicly guaranteed state-owned enterprise (SOE) debts.[18]

As per the State Bank of Pakistan (SBP), the total external debt stock (including public, publicly guaranteed, and private sector external debt) was reported at $131.069 billion in December 2024[19], while the external public debt of Pakistan was recorded at $87.4 billion at end-March 2025.[20]

The public debt increased over the past decade due to persistent fiscal deficits, high security expenditures, currency depreciation, and emergency borrowing for crises such as the 2022 floods. Interest payments remain a significant burden, consuming an estimated 7.8% of GDP in FY2024-2025, with PKR 8.21 trillion allocated for interest payments.[21]

The public debt-to-GDP ratio was reported at 74% in FY2024; however, according to the recent budget, it is now reported to be lower than 70%. Pakistan's foreign exchange reserves stand at $16.7 billion by April 2025, while the debt servicing burden at $23 billion represents immense challenges.[22]

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17 9_Public_Debt.pdf
18 9_Public_Debt.pdf
19 Chap-5.pdf
20 FY 2025 public debt
21 Budget 2025-26
22 Budget 2025-26

BOND MATURITY CALENDAR (NEXT 5 YEARS)

Pakistan faces a series of external debt maturities, including Eurobonds (international sovereign bonds) and Sukuk (Islamic bonds), in the coming years. The major bond redemptions from 2024 through 2029 are as follows:

- **April 2026:** $1.3 billion Eurobond due. This represents the 5-year tranche of Eurobonds issued in March 2021. In 2021, Pakistan raised $2.5 billion in three tranches. The 5-year bond was initially $1 billion at a 6.0% coupon, and later an additional $300 million was tapped, making the total $1.3 billion due on April 8, 2026.

- **December 2027:** $1.5 billion Eurobond due. This is the 10-year Eurobond issued in December 2017 (coupon 6.875%). It matures in Dec 2027.

- **Late 2029:** $1.0 billion Sukuk due. In early 2022, Pakistan issued a 7-year Islamic Sukuk of $1bn (at 7.95% yield), which will mature in January 2029.

VIII
SPECIFIC INVESTMENT MEASURES

To operationalize these strategies, Pakistan can deploy a set of targeted investment measures that attract capital to achieve its climate goals. Key mechanisms include:

a. Climate Smart Accelerator Funds for Clean Energy and Industrial Decarbonization

Privately managed funds investing in renewables, EV fleets, and the low-carbon industry. Uses first-loss public or philanthropic capital to attract private investors by reducing risk. Government co-investment and offshore fund hubs (e.g., Singapore) draw international capital. GCF's $40 million climate-tech fund is already scaling startups toward 2030 climate goals and creating green jobs.

b. Green Guarantees and De-Risking Mechanisms

Public-private partnerships offer lower financial risk and costs for green infrastructure. Credit guarantees (e.g., World Bank's MIGA) make solar, wind, and EV projects bankable with cheaper financing. Pakistan's new guarantee institutions (NCGC, InfraZamin) and tools, such as first-loss capital, improve climate project credit ratings. A 2024 IFC-backed deal utilized such guarantees to fund a $50 million green tire plant, creating jobs and reducing emissions.

c. Pakistan Climate Solidarity Fund

A climate resilience fund (under ADB's $500million program) for quick, flexible budget support in disasters. Targets vulnerable communities and aligns with national adaptation plans. Uses pre-set triggers and results-based financing to fund social protection, community recovery, resilient infrastructure, and early warning systems during climate shocks.

d. IMF RST & SDRs for Local Currency Green Bonds

Leverage the IMF's Resilience and Sustainability Trust to back rupee-denominated green bonds. Pakistan's $1.3 billion RST funding provides low-cost capital to issue local green bonds without currency mismatches. IMF backing would lower interest costs, and future Special Drawing Rights allocations can expand this approach to mobilize domestic climate finance.

e. Debt for Climate Swaps

Exchange debt relief for climate action. Creditors negotiate part of Pakistan's foreign debt in return for local investments in renewables, reforestation, or adaptation. This eases debt burdens and funds climate goals, a win-win solution. Other countries (Belize, Gabon) have done it successfully. Pakistan can negotiate swaps with bilateral, multilateral, or commercial lenders to support its climate priorities.

f. Engagement with Vertical Climate Funds

Access dedicated global climate funds (GCF, GEF, Adaptation Fund, CIFs) for grants and low-interest loans. Each fund targets specific areas (mitigation, adaptation, and biodiversity). Pakistan has already secured GCF grants (e.g., a $66 million flood project and a $50 million climate innovation accelerator) and should maintain a strong project pipeline (including climate-smart agriculture, flood control, and mini-grids) to unlock more international climate finance.

g. Carbon Credit Market Development

Build a domestic carbon market to trade emission credits. Pakistan's new 2024 carbon market policy establishes rules for both voluntary and compliance markets, ensuring the integrity of credits. A clear framework will attract investment into projects that reduce emissions (such as renewables, reforestation, methane capture, and efficiency improvements) and generate tradable carbon credits, thereby linking Pakistan to the global carbon trading market.

h. Continuation of Panda Bonds: Leveraging China's Market for Green Finance

Issue Panda bonds (yuan-denominated) in China to tap its vast green investor base. Pakistan's planned 2025 Panda bond (~$200-250 million) will fund climate projects and diversify funding beyond Western markets. Yuan bonds often offer lower rates and currency diversification. With strong Chinese demand, regular Panda bonds could finance renewable energy, clean transportation, and other green projects aligned with Pakistan's climate goals.

i. Expanding Local Currency Green Bonds

Mobilize domestic investors with Pakistani rupee green bonds. Pakistan's first PKR Green Bond (Rs1 billion Parwaaz bond) was used to fund clean energy, sustainable agriculture, and transport, thereby reducing CO_2 emissions and creating jobs. Building on that success, new themed bonds can target climate adaptation (such as flood defenses and resilient roads), water and sanitation ("blue" bonds), climate-smart agriculture, or reforestation. Local green bonds diversify funding and engage domestic capital for climate projects.

j. DOST BOND: Climate Bond via Friendly Nations

Secure climate financing from allied countries through special bonds. Instead of aid or deposits, friendly nations (e.g., Saudi Arabia, the UAE) would invest in Pakistan's "DOST" climate bonds (PKR or dual-currency), with the proceeds allocated to clean energy, water, agriculture, and health projects. This converts bilateral support into sustainable investments and limits Pakistan's FX exposure, for example, a PKR Green Sukuk backed by a hydropower dam for Gulf investors.

k. Markhor/YAK Conservation Bonds

Outcome-based bonds to fund wildlife conservation. Similar to South Africa's Rhino Bond, a Markhor (Pakistan's national animal) bond would fund habitat protection and species recovery. Investors buy the bond and are repaid with a bonus if the endangered Markhor population grows (verified independently). Backed by partners such as the World Bank and GEF, this innovative bond preserves biodiversity while enhancing eco-tourism and local livelihoods.

l. Provincial Climate Bonds: Empowering Sub-National Green Finance

Allow provinces to issue their own green bonds to fund local climate projects. Provinces have legal debt authority (post-18th Amendment) and can borrow up to 0.85% of GDP. By issuing provincial green bonds or sukuk, they can finance renewable energy and resilient infrastructure without relying solely on federal transfers. This boosts sub-national climate action, helps meet Pakistan's $348 billion 2030 climate finance needs, and alleviates fiscal strains between the center and provinces.

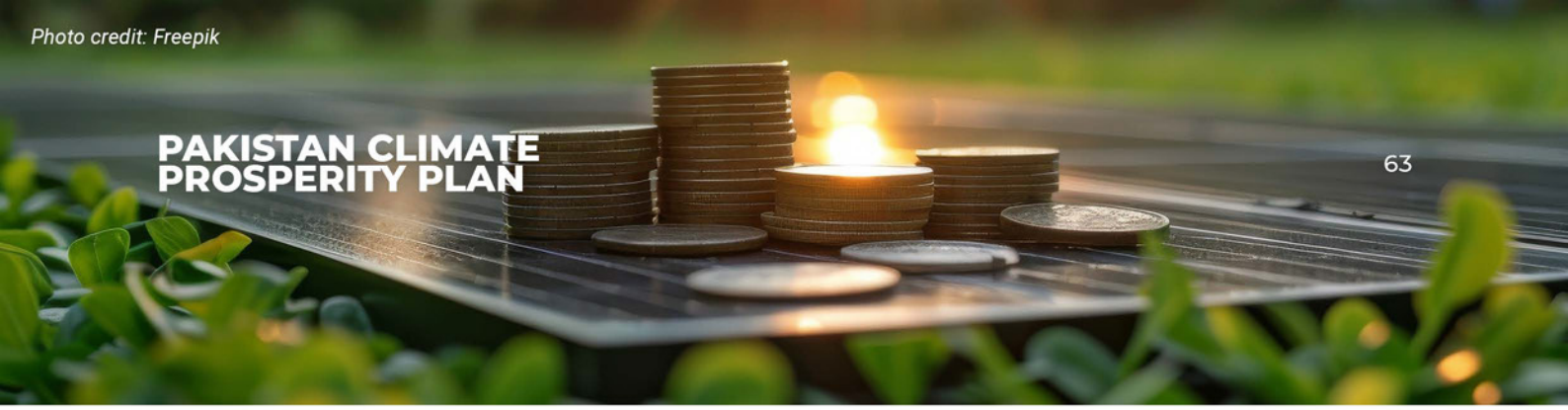
Photo credit: Shutterstock

FOREX EXPOSURE - RISKS AND MITIGATION STRATEGIES

Pakistan's foreign-exchange (FX) exposure is structural and has a multichannel impact. A large, volatile energy import bill (oil/LNG/coal) drains reserves; external public debt in foreign exchange concentrates risk and refinancing spikes; a narrow export base (now facing CBAM-style compliance pressures) limits stable FX inflows; climate shocks trigger reconstruction imports and FX-denominated premiums/coupons on risk-finance; scaling a green industrial transition still requires imported machinery and components. The gaps in long-term hedging, combined with limited local-market depth, amplify the pass-through from PKR depreciation into tariffs, inflation, and circular debt. While remittances help, they are not enough to neutralize these pressures.

The CPP therefore focuses on (i) reducing FX needs at source by accelerating indigenous renewables, localising clean-tech production, diversifying and greening exports, settling social protection and disaster payouts in PKR where possible, and deepening PKR capital markets; and (ii) buffering residual FX with hedges, guarantees, and state-contingent/indexed debt structures. This framing underpins the tailored FX Risks and mitigation strategies that follow for energy imports, debt servicing, export competitiveness, insurance/risk finance, adaptive social protection, industrial transition, and institutional capacity.

RISK AREA	CORE FX IMPACT ON THE ECONOMY	REFINED MITIGATION STRATEGIES	RESPONSIBLE INSTITUTIONS
Energy Imports (Oil, LNG, Coal, RE Technology)	• High import bills pressure forex reserves. • Rupee depreciation raises energy tariffs and circular debt. • Dependence on imported RE technology creates upfront forex outflows.	• Accelerate and scale indigenous renewables (solar, wind, hydro, biomass). • Mandate localization of RE manufacturing (panels, batteries, EVs) through incentives and local content requirements. • Expand waste-to-energy and bioenergy. • Implement robust hedging mechanisms for strategic energy imports to mitigate risks associated with these imports.	Ministry of Energy, AEDB, MoF, Provincial Governments, Private Sector Investors, Research Think Tanks



External Debt Servicing	• Exposure to USD, EUR, and CNY debt increases vulnerability. • Rising repayments threaten fiscal space. • Bond maturities risk refinancing stress.	• Expand Local Currency Green Bonds and Sukuk to raise domestic funding. • Utilize concessional FX resources (IMF RST, SDRs, ALCB Fund, TCX) for FX hedging and risk pooling. • Negotiate Debt-for-Climate Swaps to redirect FX flows to resilience investments. • Prioritize concessional and climate-linked financing to lower interest and extend tenors.	MoF Debt Management Office, SBP, CPP Country Platform, MDBs/DFIs
Export Competitiveness (CBAM, Market Access)	• Non-compliance risks EU market loss (especially textiles). • A narrow export base exposes the economy to specific market shocks. • Depreciation gives temporary competitiveness but raises input costs.	• Mandate and subsidize green certification for key export sectors (textiles, agriculture, leather). • Actively diversify exports to new markets (Gulf, Asia, Africa). • Develop carbon & biodiversity credit exports as a new, verifiable forex stream. • Establish a Carbon Border Adjustment Tax (CBAM) readiness fund.	Ministry of Commerce, EXIM Bank,BoI, SIFC, SEZ/GEZ Authorities, Private Exporters, Chambers of Commerce

Insurance & Risk Finance (Cat Bonds, Sukuk, Sovereign Insurance)	• Physical climate hazards lead to significant post-disaster foreign exchange demand through aid/ reconstruction imports. • FX-denominated premiums and coupons generate recurring foreign exchange outflows. • Post-disaster aid dependence undermines fiscal stability.	• Issue Dual-Tranche Instruments (PKR for domestic payouts, FX for international markets) to separate risk from currency. • Expand Parametric Sovereign Insurance with PKR-indexed payouts to avoid post-disaster FX demand. • Establish Provincial Climate Resilience Funds in PKR, funded by sub-national bonds/taxes.	MoF, MoCC&EC, SECP, SBP, NDRMF, Insurance Regulators, Global Shield Partners, NICL
Adaptive Social Protection (Cash Transfers, Index Insurance)	• Climate-induced disasters cause sudden, high demand for social relief. • Disaster payouts may create foreign exchange demand if denominated in USD or if the aid is foreign-funded. • Poor households are highly vulnerable to shocks without adequate financial buffers.	• Scale PKR-Denominated social safety nets (BISP, forecast-based transfers) with automatic, climate-triggered top-ups. • Expand Microinsurance (livestock, health, property) exclusively in PKR. • Integrate climate triggers into adaptive social protection to shift to *anticipatory* payouts.	MoF, BISP, Ministry of Poverty Alleviation and Social Safety (MoPASS), Provincial Governments, Microfinance Banks.

Photo credit: Freepik

Industrial Green Transition (Equipment, Machinery)	• The import of clean technology and machinery increases short-term foreign exchange demand. • A weak rupee makes technology acquisition costly.	• Incentivize local manufacturing clusters (such as solar, EVs, and batteries) to reduce import intensity and drive future exports. • Expand Green Economic Zones with strict resource efficiency standards. • Use Blended Finance with concessional FX and PKR co-financing to lower tech acquisition costs. • Target high-value green components for export to transform the sector into a net foreign exchange earner.	MoF, Ministry of Industry, BOI, SIFC, SEZ/GEZ Authorities, Private Investors
Institutional FX Risk Management Capacity	• Limited hedging instruments available for long-tenor projects. • Lack of structured FX risk frameworks in public–private projects. • An underdeveloped domestic capital market limits the scalability of PKR solutions.	• SBP to Expand Long-Tenor Hedging Facilities (for RE, infrastructure, exporters). • Mandate Embedded FX Clauses in all public-private partnership (PPP) contracts. • Establish a Sovereign FX Risk-Sharing Facility with MDBs/ DFIs to pool risk. • Develop and deepen the Local Bond and Money Markets to absorb PKR-denominated climate bonds and insurance products.	SBP, MoF, CPP Country Platform, SECP MDBs, DFIs, Provinces

LOCAL-CURRENCY CAPITAL MARKET DEEPENING

The above FX Risk Management strategy focuses on reducing the volatility of hard-currency obligations. This complementary section deepens the domestic PKR capital market, enabling more climate-resilient investments to be financed locally on longer tenors with lower FX exposure. By broadening the investor base (pensions, insurers, retail and diaspora), standardizing green issuance, activating natural-asset revenues, remittance-linked savings, and embedding a PKR-indexed risk-sharing mechanism, projects can remain attractive. The Pakistan CPP allocates a larger share of financing in local currency while maintaining access to concessional and guaranteed foreign exchange where appropriate. This twin-track design, which manages FX where it is unavoidable and replaces FX where it is not, aims to reduce imported-fuel dependence, stabilize PKR-denominated coupons and payouts, and address the cost of capital issues that typically hinder investments in climate resilience. The action areas and strategic objectives for strengthening the local currency capital market are attached as Annex IV.

IX
KEY MACRO ECONOMIC OUTCOMES

OVERVIEW OF THE GEM-CPP MODEL

The Green Economy Model (GEM) offers an integrated representation of socio-economic and environmental dynamics, and the natural capital that supports them, at the country level (Bassi, 2015; Pallaske, Bassi, Garrido, & Guzzetti, 2023). To ensure that the CPP analysis is comprehensive, accounts for several climate risks, includes relevant investment options, and produces a wide range of avoided costs and added benefits generated by climate action, several changes and additions have been made to GEM. These can be grouped into four categories: (i) the integration of detailed climate data, (ii) the estimation of a more extended list of climate change damage and assumptions for reconstruction, (iii) the integration of a variety of co-benefits of climate action, and (iv) the addition of several policy options for climate resilience.

GEM is designed to inform policymaking towards sustainable development. It enables forecasting and assessment of the outcomes of various policies and investments in relation to medium- and long-term national development targets.

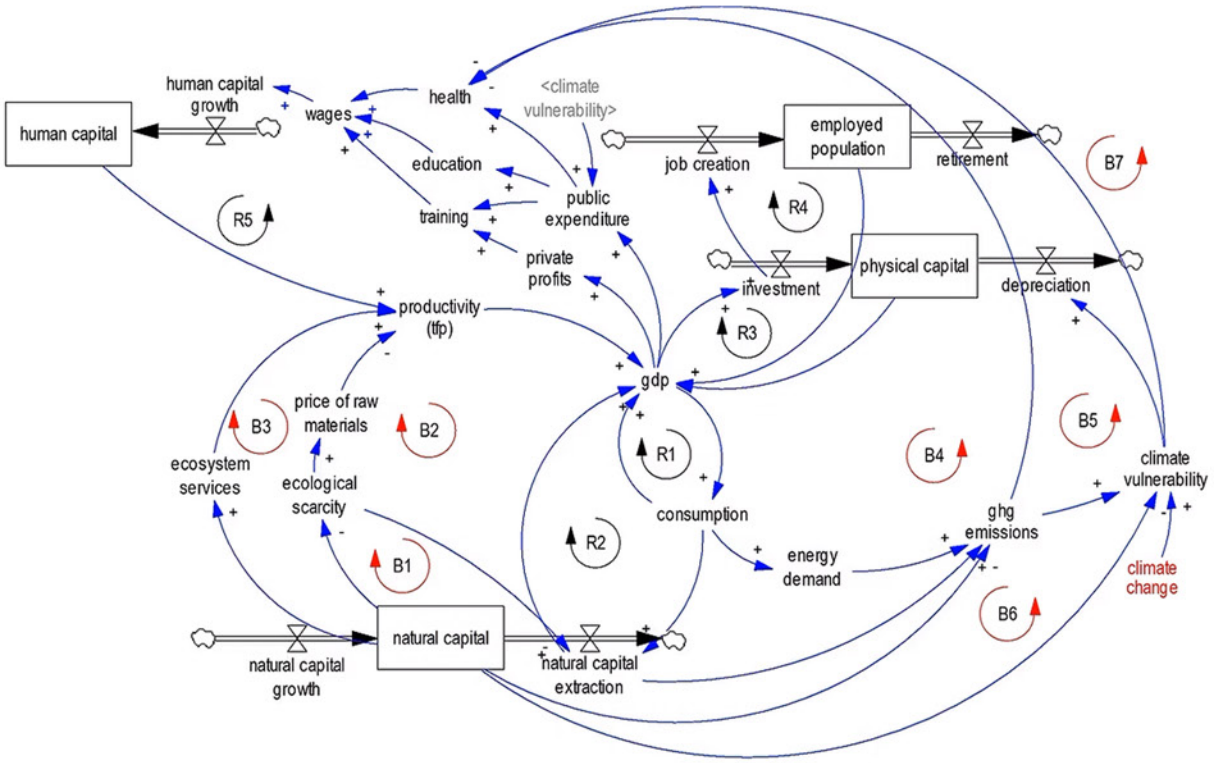


Figure 2. Overview of GEM, built on (Bassi, 2015)

The figure above presents the generalized underlying structure of GEM. On the other hand, the Figure below presents instead a subsystem diagram of the model. The former illustrates how four key capitals (built, social, human, and natural) are interconnected and how they contribute to shaping future trends across social, economic, and environmental indicators. Specifically, feedback loops can be identified that are reinforcing (R) in all areas about economic growth and social development. These are driven by investments and knowledge creation, and enabled by the availability of natural capital, which, if not

properly managed, can constrain economic growth (hence the balancing loops -(B)- identified in the diagram). Policies can be implemented to promote sustainable consumption and production, decoupling economic growth from resource use (also through education and behavioural change), to mitigate the exploitation of natural capital and generate stronger and more resilient green growth.

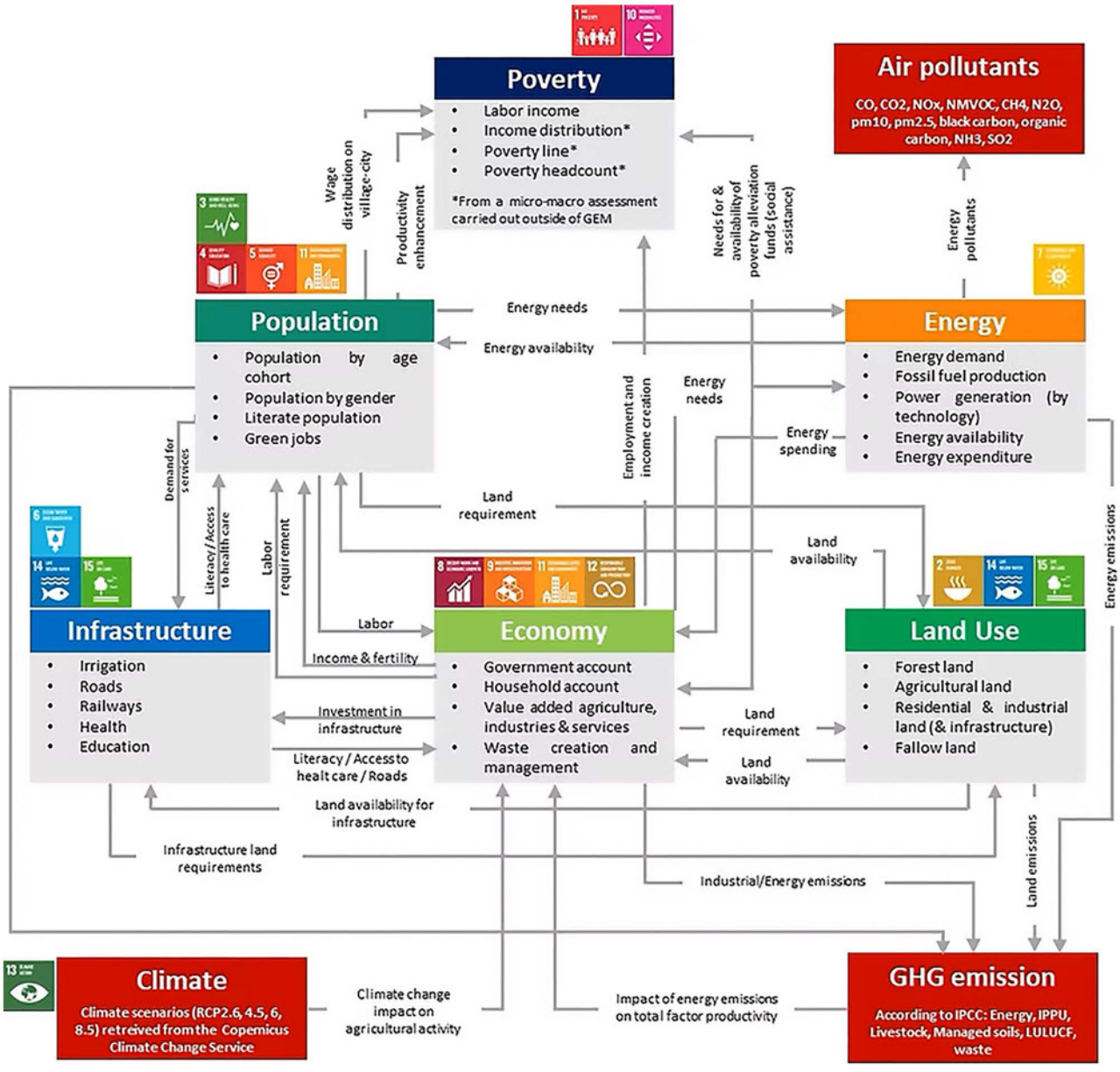


Figure 3. Sub-system diagram presenting the key sectoral components of GEM

GEM is built using the System Dynamics (SD) methodology, serving primarily as a knowledge integrator. SD is a form of computer simulation modelling designed to facilitate a comprehensive approach to development planning in the medium to long term (Meadows, 1980; Randers, 1980; Richardson & Pugh, 1981; Forrester, 2002). SD operates by simulating differential equations with "what if" scenarios, explicitly represents stocks and flows (critical to estimate climate change impacts on infrastructure,

and how such impacts accumulate over time to affect economic productivity, among other indicators), can integrate optimization and econometrics and support model coupling (e.g. in conjunction with spatially explicit models, sectoral models for energy and the economy).

Baseline data were obtained from a range of authoritative sources. Copernicus C3S and the World Bank's World Development Indicators (WDI) provided macroeconomic variables, while the IPCC AR6 informed climate risk projections. Energy consumption data were sourced from the IEA, and agricultural productivity baselines from FAOSTAT. Fiscal indicators were drawn from the IMF's Government Finance Statistics (GFS) and cross-validated with national statistics and expert consultations to ensure consistency and reliability.

Moreover, uncertainty and sensitivity analyses were conducted using Monte Carlo simulations to assess the robustness of model outcomes. The analysis tested variations in key parameters, including climate impact severity (±25%), technology cost trajectories (±30%), climate finance availability (±40%), and potential implementation delays (±2 years).

SCENARIO OVERVIEW

Three main scenarios are considered in this report: a Business As Usual case (BAU), the Nationally Determined Contribution (NDC), considering both conditional and unconditional targets, URAAN Pakistan and the Climate Prosperity Plan (CPP). The ambitions of which were determined based on the country's NDC and CPP ambitions.

BUSINESS AS USUAL (BAU)

The BAU scenario represents the status quo and serves as the baseline for the Climate Prosperity Plan. In this scenario, no additional measures for climate resilience or transition are implemented beyond what is already legally mandated or currently in practice. It reflects a future where the nation's policies and actions remain unchanged, following historical patterns and conventional practices. This scenario essentially portrays the consequences of inaction, where existing trends and behaviours persist, potentially leading to increased vulnerability to climate change impacts and lost opportunities for sustainable development.

NATIONALLY DETERMINED CONTRIBUTION (NDC) - CONDITIONAL AND UNCONDITIONAL

The NDC scenarios align with the country's official climate commitments as outlined in its Nationally Determined Contribution. It represents a structured approach to addressing climate change,

incorporating measures to reduce sectoral emissions and enhance climate resilience. The NDC scenario demonstrates a country's dedication to meeting its international climate obligations by implementing policies and initiatives outlined in its official NDC document. This scenario emphasizes a proactive response to climate change, aiming to reduce emissions and adapt to a changing climate in line with globally agreed-upon targets.Under NDC 3.0, Pakistan has committed to reduce 17% of its GHG emissions through its own resources.

CLIMATE PROSPERITY PLAN (CPP) SCENARIO

The Climate Prosperity Plan (CPP) scenario stands out as an ambitious and transformative pathway toward climate prosperity. In this scenario, the country maximizes its utilization of domestic renewable energy resources, stimulates electrification, and fosters a transition to a greener and more sustainable economy. Simultaneously, it employs comprehensive climate resilience and nature-based solutions to safeguard the nation against the adverse impacts of climate change. The CPP scenario represents a holistic strategy, focusing on economic growth, job creation, and environmental stewardship, to ensure long-term sustainability and prosperity. It exemplifies a forward-thinking and integrated approach to climate action, aiming to build a resilient and low-carbon future. In its early years (2025-2035), the CPP scenario integrates targets from the URAAN Pakistan National Economic Transformation Plan (2024-2029), the NDC 3.0, and an ambition for climate-resilient infrastructure.

AMBITIONS

The ambition indicated in the NDC column is derived from the National NDC 3.0 document. Some targets are quantitative in the NDC, some others are qualitative. This is our best effort to align the NDC with the required model inputs. Note that the combination of these ambitions across intervention options generated the desired emission reduction in 2030, as per the aggregate NDC target. The CPP ambition exceeds that of the NDC, with the most notable differences emerging towards 2050 (the target for full decarbonization), and with the explicit inclusion of targets for adaptation.

Photo credit: Cityscape of Karachi, Pakistan_April 2021 | Muhammad Jawaid Shamshad | Unsplash

MITIGATION

CLIMATE CHANGE MITIGATION							
INTERVENTION/INDICATOR	UNIT	NDC SCENARIO			CPP SCENARIO		
		2030	2040	2050	2030	2040	2050
Sustainable agriculture							
Adoption rate	%	25%	40%	50%	25%	75%	100%
Share of cropland requiring sust. Practices	%	50%	50%	50%	50%	50%	50%
Additional productivity per hectare	%		10%			10%	
Additional employment per hectare	%		10%			10%	
Additional value added per ton	%		10%			10%	
Reduction in fertilizer use per ha	%		50%			50%	
Additional CO2e sequestration	ton/ha/year		1 Ton/Ha/Year			1 Ton/Ha/Year	
Livestock							
Oilseed feeding							
Adoption rate	%	0%	40%	80%	0%	40%	80%
Expected reduction from feeding	%		20%			20%	
Days per year on diet	days/year		250			250	
Genetic improvements							
Assumed reduction in CH4 emissions from genetic improvements	%	0%	50.0%	65%	0%	50.0%	65%
Land cover							
Reforestation (cumulative)	Ha	312,082	831,665	1,768,123	2,250,000	4,004,963	7,533,325
Forest restoration (cumulative)	Ha	0	0	0	0	391,663	3,135,410
Mangrove restoration (cumulative)	Ha	8,982	45,303	104,466	23,738	100,013	224,255
Energy sector interventions							
Additional EE growth	%/Year	1.5%	1.5%	1.5%	2%	4%	4%
Fuel switching							
Electrification of petroleum demand							
Residential	%	10%	30%	45%	10%	55%	100%
Commercial	%	10%	30%	45%	10%	55%	100%
Industry	%	10%	30%	45%	10%	55%	100%
Transport	%	10%	15%	20%	10%	20%	100%

Electrification of coal demand							
Residential	%	0%	30%	50%	0%	50%	100%
Commercial	%	0%	30%	50%	0%	50%	100%
Industry	%	0%	30%	50%	0%	50%	100%
Transport	%	0%	30%	50%	0%	50%	100%
Electrification of biomass demand							
Residential	%	0%	0%	0%	10%	100%	100%
Commercial	%	0%	0%	0%	10%	100%	100%
Industry	%	0%	0%	0%	10%	100%	100%
Transport	%	0%	0%	0%	10%	100%	100%
Residential	%	0%	30%	45%	0%	33%	100%
Commercial	%	0%	30%	45%	0%	33%	100%
Industry	%	0%	30%	45%	0%	33%	100%
Transport	%	0%	30%	45%	0%	33%	100%
Power generation							
Share of electricity generated from renewables	%	42%	65%	70%	42%	65%	100%
Reduction in transmission losses	%	25%	50%	50%	25%	50%	50%
Waste management							
Waste collection rate	%	80%	90%	90%	80%	90%	90%
Additional waste recycled	%	9%	14%	14%	9%	14%	34%
Reduction in wastewater related GHG	%	10%	20%	30%	10%	45%	75%
IPPU emissions							
Reduction from improved processes	%	5%	30%	40%	5%	30%	75%
Residual GHG: reduction from CCS	%	0%	10%	20%	0%	50%	90%

Photo credit: Wind turbines in Jhimpir, Pakistan, August 2024 | Q world | Shutterstock

ADAPTATION

CLIMATE CHANGE ADAPTATION							
INTERVENTION/INDICATOR	UNIT	NDC SCENARIO			CPP SCENARIO		
		2030	2040	2050	2030	2040	2050
Agriculture land							
Temperature and drought protection							
Share of cropland requiring net shading	%	5%	5%	5%	5%	5%	5%
Share of land protected by net shading	%	0%	0%	0%	30%	75%	100%
Share of cropland requiring adaptation	%	50%	50%	50%	50%	50%	50%
Share of land using resilient practices	%	0%	0%	0%	12%	37%	50%
Share of land covered by drip irrigation	%	0%	0%	0%	30%	75%	100%
Flood protection							
Share of cropland requiring adaptation	%	50%	50%	50%	50%	50%	50%
Share of cropland equipped with drainage	%	0%	0%	0%	30%	75%	100%
Livestock							
Poultry							
Technology-based heat protection	%	0%	0%	0%	30%	50%	50%
Nature-based heat protection	%	0%	0%	0%	30%	50%	50%
Labor productivity							
Share of buildings requiring temperature adaptation	%	5%	5%	5%	5%	5%	5%
Additional buildings with airco	%	0%	0%	0%	25%	75%	100%
Buildings with retrofit insulation	%	0%	0%	0%	25%	75%	100%
Livable cities (green spaces)	%	0%	0%	0%	25%	75%	100%
Flood protection for infrastructure							
Share of buildings requiring flood protection	%	15%	15%	15%	15%	15%	15%
Share of buildings with flood protection	%	0%	0%	0%	25%	75%	100%
Services capital with flood protection	%	0%	0%	0%	25%	75%	100%
Power generation							
Wind protection							
Share of power generation capacity requiring adaptation	%	40%	40%	40%	40%	40%	40%

Thermal generators	%	0%	0%	0%	25%	75%	100%
Wind generators	%	0%	0%	0%	25%	75%	100%
Solar generators	%	0%	0%	0%	25%	75%	100%
Share of transmission network requiring adaptation	%	40%	40%	40%	40%	40%	40%
Flood protection							
Share of power generation capacity requiring adaptation	%	40%	40%	40%	40%	40%	40%
Thermal generators	%	0%	0%	0%	25%	75%	100%
Hydropower	%	0%	0%	0%	25%	75%	100%
Share of transmission network requiring adaptation	%	40%	40%	40%	40%	40%	40%
Electrical substations/transmission lines	%	0%	0%	0%	25%	75%	100%

Photo credit: Pakistan shepherds | Dave Primov | Canva

SIMULATION OUTCOMES

The results of the analysis show that the CPP scenario offers a strong synergy between investments, economic growth, social empowerment, and environmental preservation, as follows:

A. ECONOMY

Under the BAU scenario, nominal GDP[23] is projected to increase to 4.35 trillion by 2050. In contrast, under the CPP scenario, nominal GDP is expected to reach USD 7.03 trillion[24] by 2050, also 61.7% higher than BAU. This implies that the BAU scenario achieves an average annual growth rate of 10.8% between 2025 and 2050, while the CPP reaches 12.9%. The main factors affecting GDP, and hence the higher growth in the CPP scenario, are the reduction in energy costs and associated externalities, proactive measures to decrease climate change damages, and the promotion of increased capital accumulation through investments in sustainable and climate-resilient initiatives.

GDP grows fastest up to 2030 in the CPP scenario, as a result of the implementation of the URAAN Pakistan plan, and after 2040, with the goals of full decarbonization and high climate resilience being achieved.

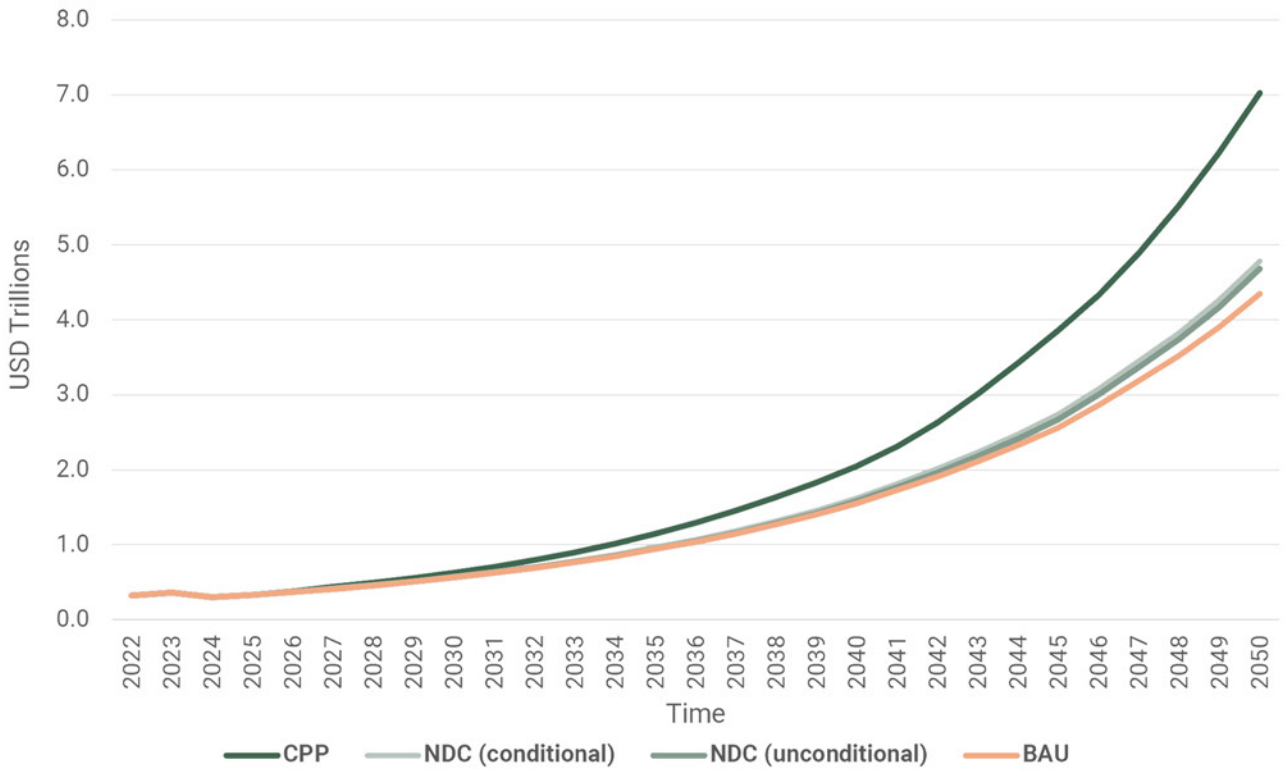


Figure 4. Nominal GDP, under different scenarios (in trillions USD)

[23] The base year for the deflator is set at 2015.
[24] All calculations are conducted in U.S. dollars (USD) to ensure consistency, without conversion into local currencies.

Photo credit: Karachi, Pakistan, October 2020 | Muneer ahmed ok | Unsplash

Under the BAU scenario, the percentage of the population living below the poverty line declines from 46 percent in 2025 (under the international poverty line of $4.20 per person per day) to 27 percent in 2050, with the total number of people in poverty decreasing from 116 million to 102 million over the same period. In the CPP scenario, the poverty rate drops further to 19 percent in 2050, with the number of people below the poverty line declining to 71 million. This is a reduction close to 62% compared to BAU. In the NDC scenarios, the reduction is 7.7% and 10.1% respectively for the unconditional and conditional simulations.

The key drivers of the CPP scenario include disposable income relative to 2000 and population trends. The primary indicator used in this analysis is the percentage of the population below the poverty line, which represents the share of the total population living in poverty. It is also worth mentioning that the reduction in climate damages will increase equity, and the increased forest cover will increase access to ecosystem services, expanding the advantages beyond monetary measures of poverty.

An additional economic benefit of low carbon development is the potential to generate carbon credits. In the CPP scenario, by 2050, the value of carbon credits is forecasted to reach USD 6 billion, higher than the USD 3.85 billion in NDC conditional scenario and USD 3.4 billion in the NDC unconditional scenario. This outcome is driven primarily by reforestation efforts, which are emphasized in all URAAN Pakistan plan, NDC 3.0 and CPP. The primary indicator for this assessment is the generation of carbon credits, a monetary evaluation of GHG emission reductions and increased carbon sequestration.

Insurance plays a pivotal role in climate mitigation and adaptation. By 2050, if we compare a CPP simulation with and without insurance, the additional required cumulative insurance payments amount to USD 261 billion. This corresponds to average annual payments of USD 10.45 billion (Rs 538 billion) per year between 2025 and 2050. The additional insurance payments in this CPP scenario unlock USD 158 billion in GDP over the same period, cumulatively. This corresponds to approximately USD 6.1 billion per year, resulting in a GDP-to-additional-insurance-payments ratio of close to 0.6 USD per payment over this period.

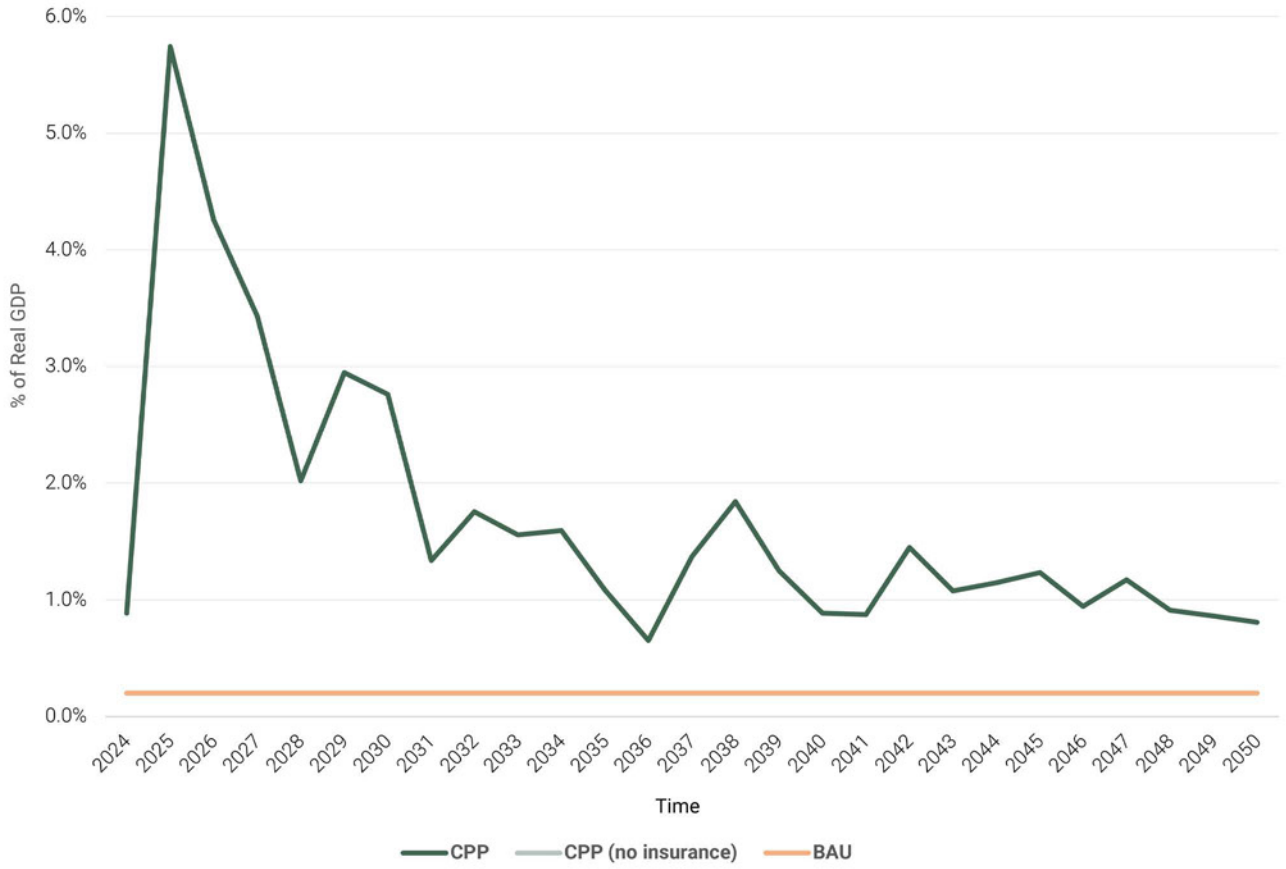


Figure 5. Insurance payments as share of GDP, BAU, and CPP scenarios

B. SOCIAL

In the BAU scenario, total employment is projected to reach 122 million people by 2050. In contrast, the CPP scenario projects total employment to increase to 125 million people by 2050, representing a 3.1 percent rise compared to the baseline. The NDC scenario shows an increase of 1% (unconditional) and 1.2% (conditional) relative to the BAU by 2050. The drivers behind this increase in the CPP scenario include higher GDP, land use for agriculture, and the ambition of transition and adaptation interventions. The relevant indicator for this analysis is the ratio of the total unemployed population to the total population across all sectors, including green jobs.

It is worth noting that employment is forecasted to grow considerably already in the short and medium term in the CPP scenario. The URAAN Pakistan plan emphasizes the expansion of agricultural land (with an additional 20.3 million acres of land to be cultivated, equivalent to 8.2 million hectares) and reforestation and land restoration (to increase forest coverage to 6% of the geographic area). The increased employment in industry and services resulting from higher GDP growth (at 6% per year on average up to 2030) consistently results in higher employment than the BAU case throughout the simulation. Practically, up to 2030, approximately 1.6 million jobs are expected to be added per year, in alignment with the URAAN Pakistan target for employment creation.

The strong job creation is reflected by the forecasted unemployment rate. In the BAU scenario, the unemployment rate is expected to average 5.6 percent over the period from 2025 to 2050. In comparison, the CPP scenario sees the unemployment rate average 2.2 percent over the same period, while the NDC scenarios reach 5.2% (unconditional) and 5% (conditional).

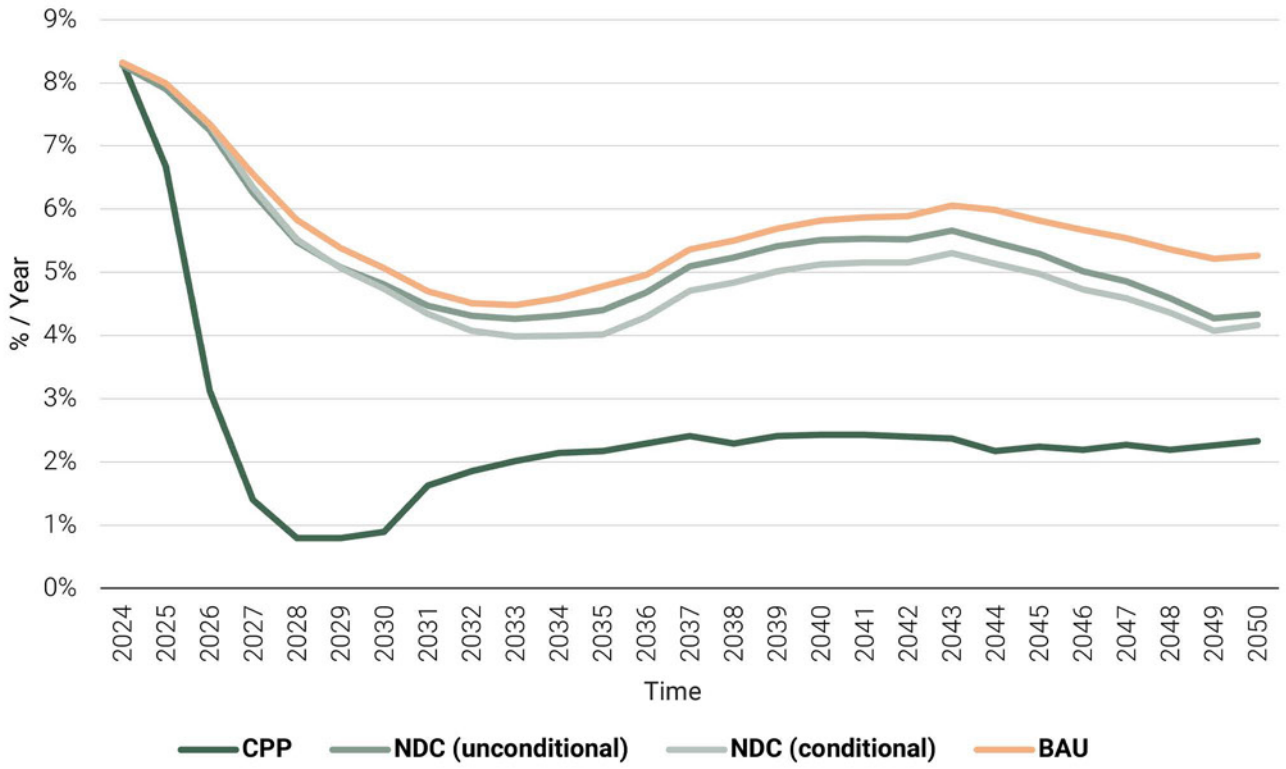


Figure 6. Unemployment rate, BAU, NDC, and CPP scenarios

In the BAU scenario, the number of green jobs is projected to increase from 438,000 people in 2025 to 690,000 people by 2050. In the CPP scenario, however, green jobs are expected to rise significantly, reaching nearly 3 million people by 2050. Additionally, in the BAU scenario, the share of green jobs is expected to slightly increase, from 0.55 percent in 2025 to 0.57 percent in 2050. In contrast, in the CPP scenario, the share of green jobs in total employment is projected to increase significantly, reaching 2.4 percent by 2050, more than four times the share seen in the baseline.

Photo credit: Fishermen in Karachi, Sindh, Pakistan, March 2018 | Najmul Hasan | Pexels

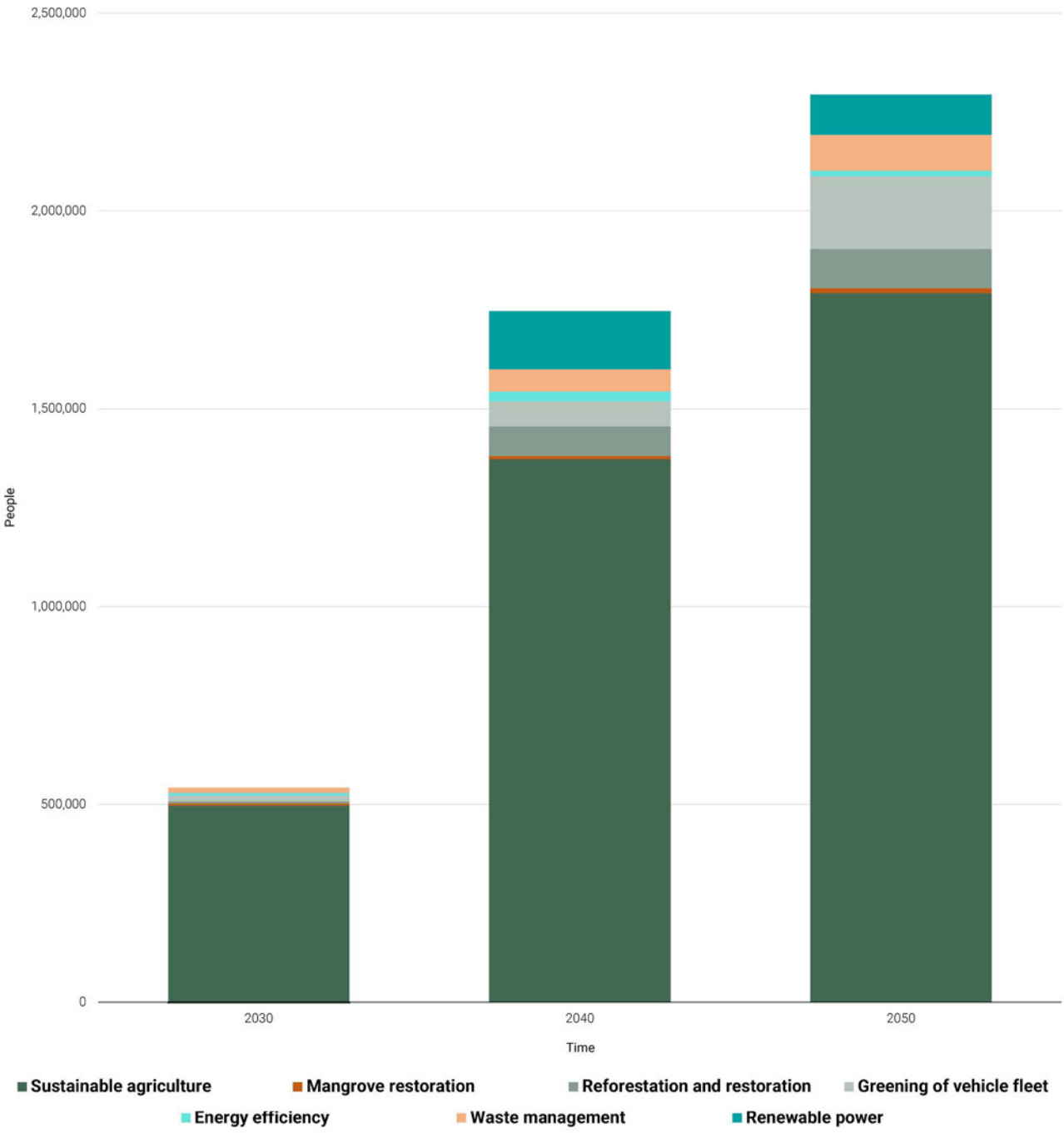


Figure 7. Green jobs by intervention option, CPP scenario

In the BAU scenario, the population connected to sewage treatment facilities is projected to increase from 181 million people in 2025 to 267 million people by 2050. In contrast, in the CPP scenario, the number of people connected to sewage treatment is expected to reach 376 million by 2050. This demonstrates the considerable impact of the Climate Prosperity Plan in alleviating poverty, as its policies and initiatives contribute to a more inclusive and economically prosperous society compared to the BAU scenario.

In the BAU scenario, total annual deaths from ambient and indoor air pollution are projected to increase

from 361,000 people in 2025 to 932,000 people by 2050. However, in the CPP scenario, the total annual deaths from both indoor and ambient air pollution are expected to decline to close to zero by 2045 (Figure 8), primarily as a result of the decarbonization of energy consumption and power generation. This improvement aligns with the target on air pollution in the URAAN Pakistan plan, which aims for an 81% reduction in pollutant emissions by 2040. The NDC scenarios indicate a more moderate reduction (40% relative to BAU by 2050).

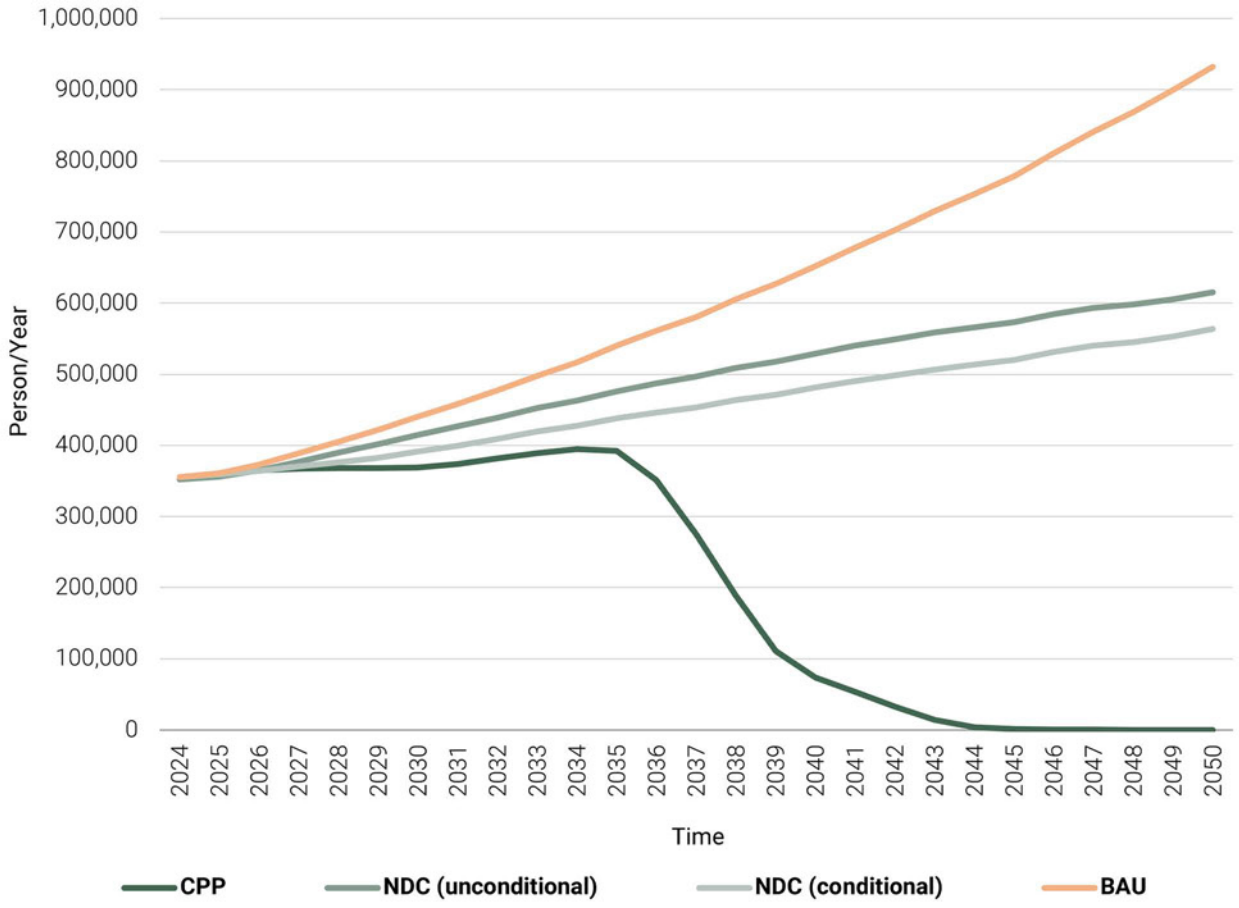


Figure 8. Annual deaths from air pollution, BAU, NDC, and CPP scenarios

C. ENERGY

In the BAU scenario, energy consumption is projected to grow from 3.9 million TJ in 2025 to 7.7 million TJ by 2050. In contrast, in the CPP scenario, energy consumption is expected to grow in the short term, plateau in the medium term, and then decline to reach 2.2 million TJ by 2050. This reduction is driven by several factors within the CPP, including improved energy efficiency (also stressed in the URAAN Pakistan plan and NDC 3.0) and increased electrification, which carries higher efficiency, both of which contribute to a more sustainable and energy-efficient future. The NDC scenarios exhibit a more stable trend, with a 37% (unconditional) and 43% (conditional) reduction relative to BAU in 2050.

The CPP reduction is instead close to 72%. Energy intensity in the NDC scenarios declines faster than the historical trend, offsetting the upward pressure of population and GDP growth; however, it does not result in the transformational change observed in the CPP case.

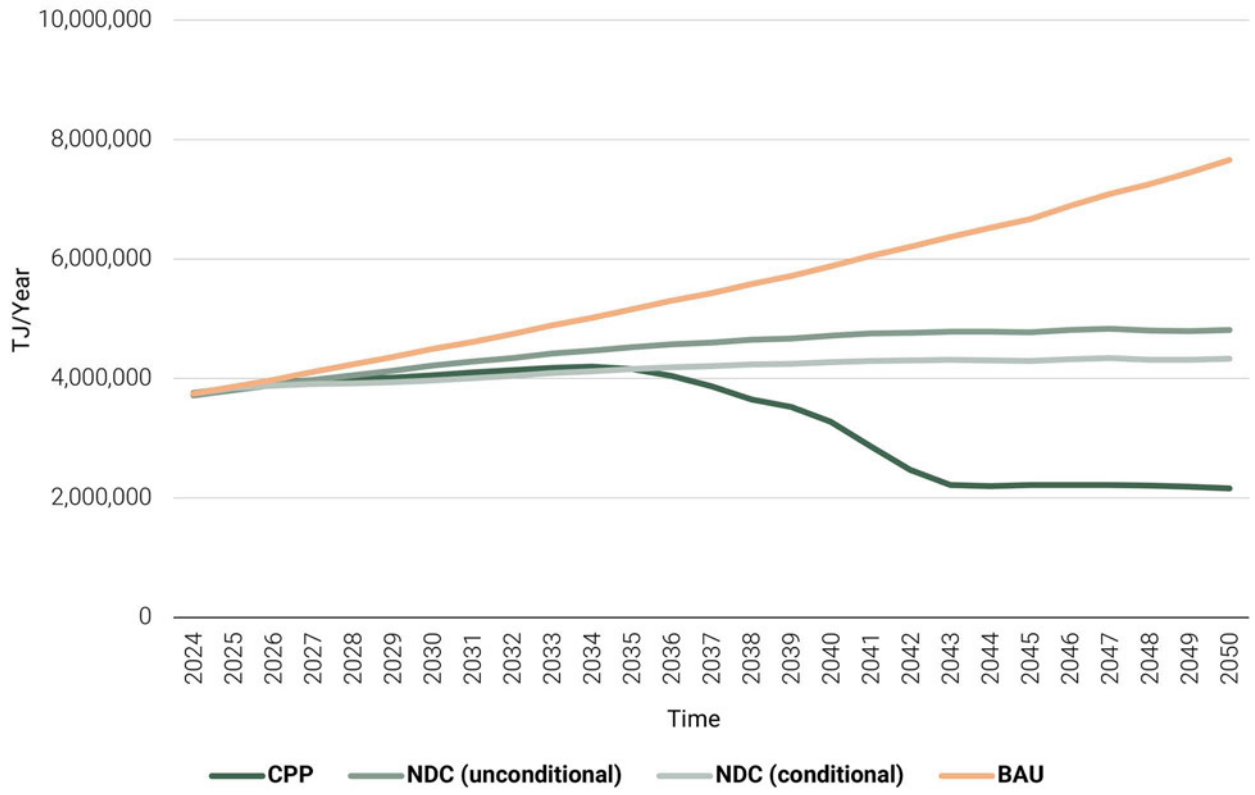


Figure 9. Final energy consumption, BAU, NDC, and CPP scenarios

In the BAU scenario, the energy bill as a share of GDP is projected to decrease from 11.1 percent in 2025 to 9.1 percent in 2050. In the CPP scenario, due to lower energy consumption and decarbonization efforts, the energy bill as a share of GDP is expected to decrease, reaching 2.7% of GDP by 2050.

The NDC scenarios also see a reduction, with the energy bill as a share of GDP in the range of 6% in 2050. This reduction is driven by several key factors within the CPP, including the higher GDP generated by the plan (pushing energy demand higher) and the comprehensive efforts to increase energy productivity (pushing energy demand lower). The indicator of the energy bill as a share of GDP reflects the efficient and sustainable utilization of energy resources in the CPP, contributing to economic prosperity and environmental responsibility.

Further, the higher growth in GDP and income increases affordability, especially in the CPP scenario. In the BAU, the energy affordability index is projected to increase from 1.49 in 2025 to 1.76 in 2050. The NDC scenarios show an improvement to 2.64–2.69 (unconditional and conditional). In the CPP scenario, however, the energy affordability index is expected to rise more significantly, to 5.95 by 2050. This indicates a substantial enhancement in energy affordability for the population within the CPP, in addition to higher access to modern and cleaner forms of energy.

Concerning electrification, a key pillar of the NDC 3.0 with a target of 30% sales of EVs by 2030, in the CPP scenario, there is a significant shift towards low-carbon vehicles, resulting in a substantial increase in electricity demand from vehicle electrification. By 2050, the total electricity demand from electrifying the vehicle fleet reaches 587,000 TJ, and electricity demand grows to more than 500 TWh/year by 2045.

This highlights the CPP's proactive approach in promoting the adoption of electric vehicles, which contributes to a more sustainable and lower-carbon transportation system compared to the BAU scenario. In the CPP scenario, the total number of low-carbon vehicles is expected to reach 35 million by 2050. This includes 17.6 million electric vehicles, 12.4 million plug-in electric vehicles, and 5.3 million hybrid vehicles. A significant increase is driven by factors such as ambitious vehicle electrification goals and GDP growth.

Figure 10. Share of electricity generation from renewable energy, under different scenarios

Concerning electricity supply, in the BAU scenario, the share of power generated by renewable capacity is expected to remain constant at around 40 percent between 2025 and 2050 (Figure 10). In contrast, in the CPP scenario, the share of power generated by renewables is projected to reach 68.5% by 2035 and 100% by 2050. This is aligned with the NDC 3.0 target on power generation capacity, stating that by 2035, renewable energy (including hydropower) and clean energy are expected to reach 62% and 69% of the planned capacity mix.

D. ENVIRONMENT

In the BAU scenario, annual CO2e emissions are projected to increase from 530 million tons of GHG in 2024 to approximately 1.1 billion tons of GHG by 2050 (a 100% increase in 25 years). The NDC scenarios see a reduction in the growth of emissions, with the unconditional scenario reaching 750 million tons by 2050 (a 30% reduction relative to BAU and 42% increase relative to 2025). The conditional scenario achieves a small reduction at 505 million tons (-53% when compared to the BAU, and -4.3% relative to 2025).

In contrast, in the CPP scenario, annual CO2e emissions are expected to decrease to net zero by 2050, reflecting a gradual decline towards carbon neutrality (Figure 11). The CPP's effectiveness in achieving this significant reduction in emissions is driven by various factors, including improved energy efficiency, increased electrification, the extensive adoption of renewable energy sources, reforestation, and ambitious policy initiatives across various sectors, all contributing to a sustainable and environmentally responsible future.

It is worth noting that, in the CPP scenario, there is an increase in emissions in the short term, until 2030. This is due to the ambitious expansion of cultivated areas under the URAAN Pakistan plan, which generates considerable improvements in job creation, agricultural production, value added, and food security. The increase in emissions from land conversion from fallow to agriculture is compensated over time by efforts on reforestation. The additional carbon sequestration from reforestation allows for the offset of remaining emissions from industry, waste, livestock, and land management.

Furthermore, Figure 11 presents a comparison between NDC 3.0 scenarios and the BAU, NDC, and CPP forecasts generated using GEM. A key difference between the GEM and NDC 3.0 scenarios should be noted: the BAU scenario, and hence the CPP, assumes a continuation of historical trends. These include the equipment with newer and more efficient options. It results that the BAU scenarios accounts for growing energy demand per person (following the historical trend of the past 10 years), but also considers a gradual reduction of energy intensity (i.e. energy consumption per unit of GDP, also following historical trends), and a stable trend for carbon intensity (due to the lack of additional efforts towards electrification and renewable energy penetration in the BAU case). The CPP scenario alters these trends, with lower energy demand per person, a faster decline in energy intensity, and rapid decarbonization of energy by 2050. The NDC 3.0 scenarios, even in the most ambitious case, are more conservative compared to the CPP in terms of increased productivity of energy use and carbon intensity. The reference scenario developed for NDC 3.0 does not consider any effort (not even a baseline or business as usual) to reduce emissions, hence the difference shown.

Photo credit: Aerial view of Gujranwala, Punjab, Pakistan, September 2020 | Aliyan Mughal | Pexels

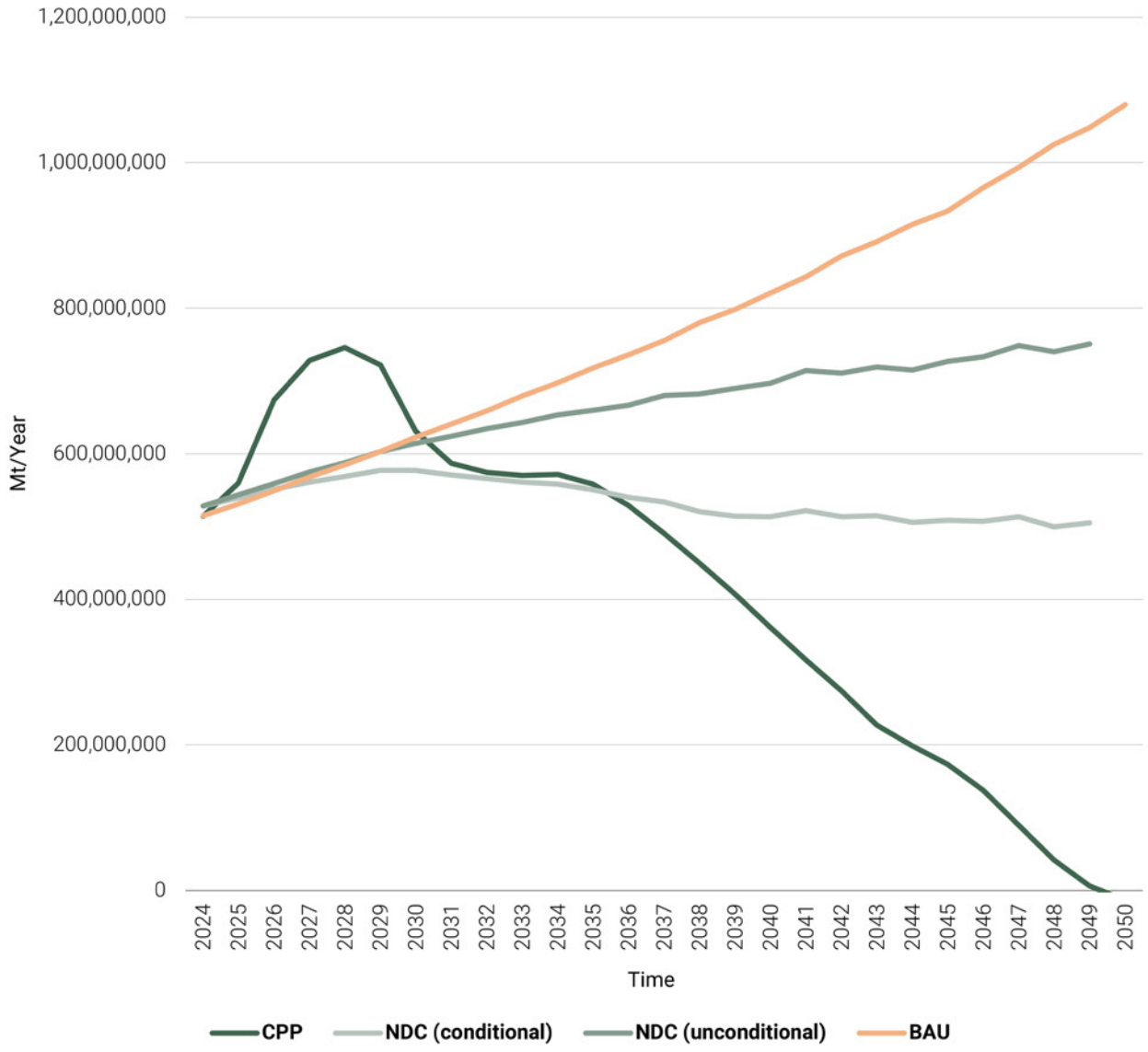


Figure 11. Annual CO_2e emissions, BAU, NDC, and CPP scenarios

In the BAU scenario, cumulative damages from climate change are projected to total 280 billion USD over the period from 2000 to 2050 (or USD 5.6 billion on average for the period). In the CPP scenario, however, cumulative damages are expected to amount to 274 billion USD over the same period, which represents a 2.9 percent decrease compared to the BAU. This may be a surprising outcome, given efforts to improve climate resilience (i.e. a small reduction in loss & damage when compared to the ambition for climate resilience).

On the other hand, it is worth noting that GDP is forecasted to be 62% higher in the CPP scenario by 2050 than in the BAU case. As a result, we see climate loss & damage being 2.9% lower, while GDP is 62% higher. This represents a significant reduction in national-level climate vulnerability. Practically, it indicates that, despite a considerable increase in the CPP scenario over BAU in buildings, roads, power generation capacity, and transmission lines, and more generally in productive capital for industry and services, the loss & damage will largely remain unchanged.

E. CONCLUSION

The Pakistan Climate Prosperity Plan (CPP) outlines a long-term investment strategy and a strategic blueprint for navigating the challenges and opportunities of climate change in Pakistan. The CPP presents actionable pathways that integrate climate goals with national development agendas, prioritizing low-carbon, sustainable economic growth, resilience, and inclusivity. It emphasizes targeted investments in renewable energy, climate-resilient infrastructure, sustainable agriculture, water resource management, circular economy, and disaster risk mitigation as critical components for transforming Pakistan's economic future.

The investment and growth requirements for the CPP are fully aligned with URAAN Pakistan and NDCs 3.0. CPP's increased investment targets for 2050 suggest that long-term investments will match those outlined in the NDC, with total undiscounted investments estimated at about USD 1.6 trillion, or roughly USD 65 billion annually. This nearly coincides with the NDC's average annual investment estimate of USD 56 billion. By 2030, CPP projects an investment of USD 348.4 billion, increasing to USD 565.7 billion by 2035, which aligns with NDCs 3.0. Additionally, the projected GDP growth of 6% until 2029 reflects a coordinated and consistent approach across these frameworks, extending to 2035 for the NDC and 2029 for URAAN.

The CPP emphasizes the importance of innovation and bold action in addressing challenges through a structured approach. It advocates for leveraging strong financial mechanisms, adopting a green economic model, and establishing strategic partnerships while enhancing capacity-building initiatives to empower communities.

Ultimately, the Climate Prosperity Plan serves as a critical call to action that requires a collaborative effort from policymakers, private sector leaders, international partners, and civil society. The policy choices, partnerships, reforms, and commitments we make today will shape Pakistan's future in the face of climate challenges.

X
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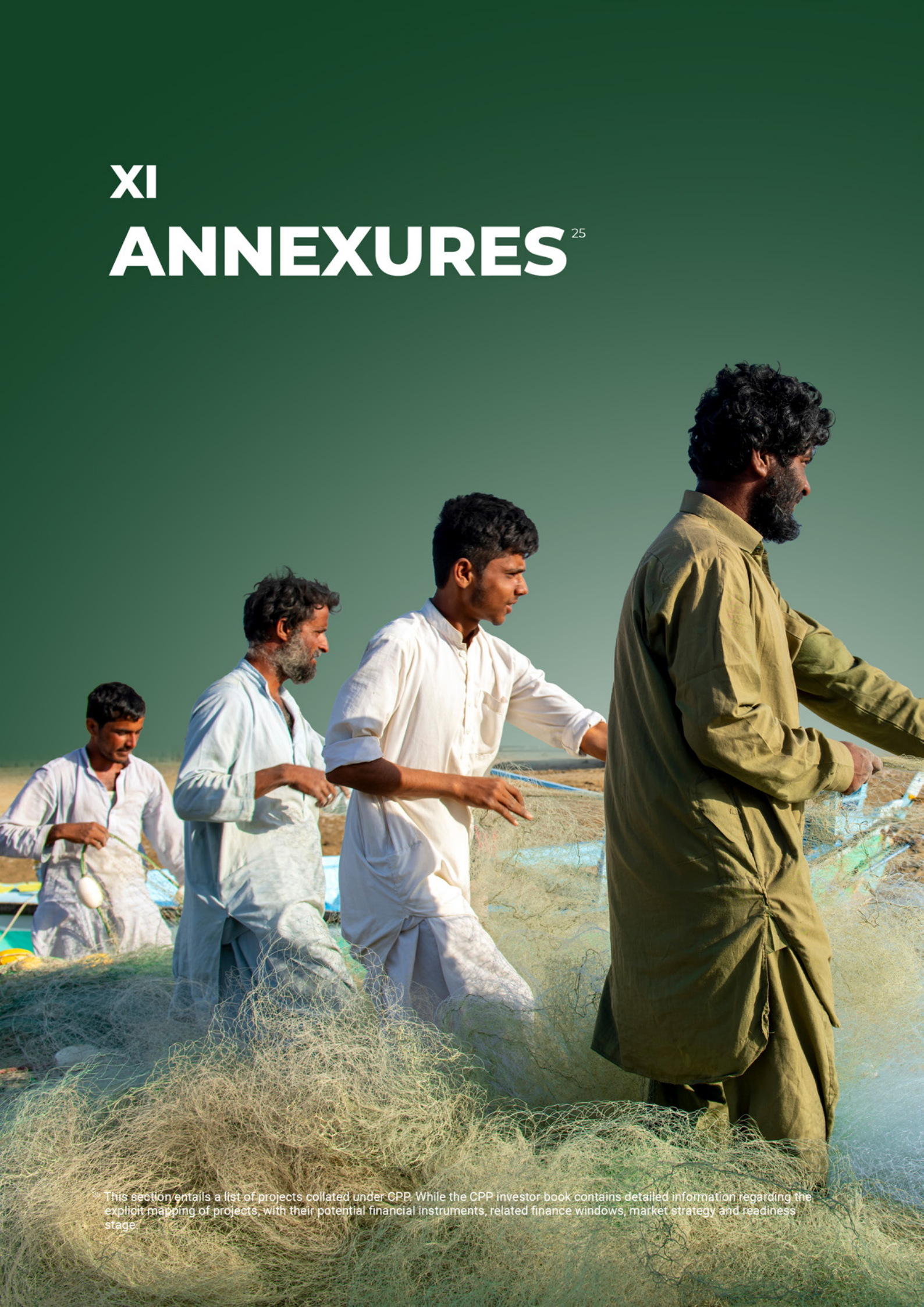
XI
ANNEXURES[25]



[25] This section entails a list of projects collated under CPP. While the CPP investor book contains detailed information regarding the explicit mapping of projects, with their potential financial instruments, related finance windows, market strategy and readiness stage

A. CPP PAKISTAN: PIPELINE PROJECTS

(Total Projects: 69 & Total Amount US$: 4.877 billion)

1. ENERGY OPTIMIZATION & JUST TRANSITION

No. of Projects: 9 | Amount: US$ 1,312.24

SR	TITLE	OVERVIEW	LOCATION	FUNDING NEEDS IN $M
		Procurement Ready Projects[26]		
1	Floating Solar Power Project	A 500 MW floating solar power plant is set to be established on Keenjhar Lake, aimed at providing renewable electricity to K-Electric. This innovative facility will utilize advanced photovoltaic technology while preserving valuable land.	Keenjhar Lake, Sindh	$243.60
2	300 Mega Watts Balakot Hydropower Project	BTHPP (300 MW) is a public sector, donor-funded national-level hydropower energy project that aims to provide clean energy and create jobs, including livelihood initiatives, for local communities.	KPK	$342.38
3	157 MW Madyan HPP at the Swat River	A public sector donor-funded national-level hydropower energy project to provide clean energy and jobs, including livelihood initiatives for local communities.	KPK	$284.14
4	88 MW Gabral Kalam HPP at Gabral River	A public sector donor-funded national-level hydropower energy project to provide clean energy and jobs, including livelihood initiatives for local communities.	KPK	$130.11
5	84 MW Gorkin Matiltan HPP at Oshu River	A public sector national-level hydropower energy project to provide clean energy and jobs, including livelihood initiatives for local communities	KPK	$127.71
		Early Stage Projects[27]		
1	National Energy Efficient Appliances Market Transformation Program	The National Energy Efficiency and Conservation Authority (NEECA) proposes a nationwide program to shift Pakistan's appliance market toward high-efficiency products.	Pakistan	$120.00

[26] Projects that have completed relevant technical and financial preparation and can enter tendering, contracting, or financing processes.
[27] Projects that have defined objectives, preliminary designs and feasibility studies but lack detailed assessments, and structuring before procurement.

2	**Conversion of Traditional Brick Kilns to Zig Zag Technology**	The project will convert 400 traditional brick kilns to zig-zag technology, reducing coal use, cutting greenhouse gas and black carbon emissions, and improving air quality. This transition supports climate change mitigation, enhances worker health, and promotes cleaner, more sustainable brick production.	KPK	$4.00
		Concept Ready Projects[28]		
1	**Clean Cookstove Project Pilot Initiative**	Pilot clean cookstove initiative to deploy 2,200 improved biomass cookstoves that will generate significant carbon emission reductions in collaboration with Sindh People Housing Foundation (SPHF)	Sindh	$0.30
2	**100 MW Chagai Solar Park**	Develop, commission and operate 100 MW DC of utility-scale solar PV in Chagai District. Provide low-carbon electricity to support mining operations and local grid needs, displacing diesel/thermal generation.	Chagai District	$60.00

2. GREEN ECONOMIC ZONES (GEZs)

No. of Projects: 3 | Amount: US$ 686.90

SR	TITLE	OVERVIEW	LOCATION	FUNDING NEEDS IN $M
		Procurement Ready Projects		
1	**Enhancing Green Export Capacity Through Green Financing**	A concessional finance program to support green exports in Pakistan aims to promote sustainable development by providing low-interest loans and financial incentives to environmentally focused businesses	Pakistan	$615.00
2	**Balochistan Solar Energy Project**	A portfolio of grid-connected and captive solar power plants in Balochistan under the PPP mode (DBFMOT). Total capacity: 95 MW across four sites (Hub – 50 MW, Gwadar – 20 MW, Quetta – 20 MW, Bostan SEZ – 5 MW). Projects will collectively generate ~208 GWh annually.	Hub, Gwadar, Quetta and Bostan, Balochistan	$58.00
3	**Faisalabad Garment City Industrial Complex (FGCC-PP)**	The Faisalabad Garment City (FGCC) project aims to redevelop and optimally utilize FGCC's greenfield and brownfield properties under a Public-Private Partnership (PPP). Located in value addition city, Faisalabad, the project will provide modern, plug-and-play industrial spaces with state-of-the-art infrastructure to garment and textile SMEs.	Faisalabad, Punjab	$13.90

[28] Projects at the idea or scoping stage that outline a problem and proposed solution but require full development, to advance to early-stage readiness.

3. CLIMATE RESILIENT AGRICULTURE

No. of Projects: 12 | Amount: US$ 337.85

SR	TITLE	OVERVIEW	LOCATION	FUNDING NEEDS IN $M
		Procurement Ready Projects		
1	Sustainable Timber Harvesting Project	The project involves the large-scale plantation of 7 million fast-growing timber trees across Punjab & KPK in Pakistan. It addresses the timber demand-supply gap by establishing legal, traceable, and sustainable timber sourcing while contributing to carbon sequestration, biodiversity restoration, and rural livelihoods	Punjab and KPK	$50.00
2	Digital Dera Climate Smart Villages Network	The pilot program at Chak 26 S/P serves a community of 25,000 people across 1,200 households. The Digital Dera initiative was launched in October 2021 and aims to provide climate-smart digital hubs, promote regenerative agriculture, offer clean energy solutions, and facilitate training and market linkages. Currently operational in 10 villages, the goal is to expand to 200 villages by 2030, ultimately reaching 4 million households.	Pakistan	$45.00
3	Climate Precision Agriculture	The proposed project presents an integrated set of mechanization solutions to improve farm yields & farm economics through the introduction of precision land leveling, precision cultivation & planting, precision-based crop surveillance & nutrition, efficient irrigation, contemporary harvesting & grain conservation, scientific post-harvest handling & drying, soil conservation & enrichment through mechanized post-harvest management of the farm, etc.	Punjab	$21.50
4	ColdHub Pakistan	ColdHub Pakistan aims to address the post-harvest losses in Pakistan's agricultural supply chain by introducing sustainable cold storage facilities powered by renewable energy. In Pakistan, 30–40% of perishable food is lost due to inadequate storage and inefficient supply chain management. ColdHub Pakistan proposes solar-powered cold storage units in major agricultural hubs and peri-urban markets to reduce food waste, enhance farmer income, lower greenhouse gas emissions, and improve food security.	Multan and Faisalabad, Punjab	$5.00
5	Promoting Sustainable Livelihoods, Green Infrastructure, and Climate Resilience through Olive Cultivation and Apiculture along National Highways in Balochistan (Phase-II Green Balochistan Initiative)	The proposed project promotes sustainable olive cultivation and agroforestry along Balochistan's national highways to enhance domestic edible oil production and reduce dependence on imports. Through large-scale olive plantations, nurseries, processing units, and market linkages, it will establish a robust olive-based value chain, create employment opportunities, and enhance rural livelihoods through community engagement and skills development.	Balochistan	$30.00

6	**Rice-Wheat Farm Mechanization Component: Transforming Sindh's Agriculture through Service Providers**	The project introduces mechanization services for rice and wheat farmers in Sindh via a service provider model (Khushaal Kissan Private Limited).	Sindh	$60.00
7	**Scaling Climate-Smart Mechanization for Smallholder Farmers**	Machvista Engineering (Pvt) Ltd. proposes to design, manufacture, and deploy affordable climate-smart farm implements (intercultivators, precision fertilizer applicators, and crop-specific tools) tailored for smallholder farmers.	Pakistan	$20.00
	Early Stage Projects			
1	**Scaling Biochar for Climate-Resilient Agriculture**	This project aims to establish decentralized biochar production and application systems across Pakistan's climate-vulnerable agricultural regions.	Pakistan	$15.00
2	**Post-Harvest Value Chain Development**	Development of modern cold chain, processing, drying, and packaging units, as well as certification systems, to reduce fish loss and increase product value.	Gwadar, Pasni and Hub, Balochistan	$12.50
3	**Climate-Smart Management and Biosaline Remediation**	Project aims to determine the extent of salt-affected soil in Balochistan. The goal is to improve soil productivity by using soil amendments, better farming practices, and sustainable cropping systems. Additionally, the goal is to evaluate and develop salt-tolerant plant varieties and halophyte species.	Balochistan	$25.00
	Concept Ready Projects			
1	**Integrated Climate-Resilient Agriculture Prosperity Plan (CRAPP)**	Establishment of high-value climate-adapted orchards & Integrated Pest Management (IPM) Practices.	KPK	$3.15
2	**Financing of Agri Green Banking Products**	Small and subsistence farmers, who cultivate less than 12.5 acres of land, are particularly vulnerable to the risks posed by climate change. International financial support should be directed in the form of grants or aid. By doing so, the bank aims to provide financing to small and resource-poor farmers.	Pakistan	$49.70

Photo credit: Traditional farming in Sindh, Pakistan, June 2025 | Saeed Ahmed Abbasi | Pexels

4. CLIMATE RESILIENT INFRASTRUCTURE

No. of Projects: 7 | Amount: US$ 350.25

SR	TITLE	OVERVIEW	LOCATION	FUNDING NEEDS IN $M
		Procurement Ready Projects		
1	**Community-Led Micro-Watershed Restoration for Flood Resilience and Livelihood Security**	This five-year project (2025–2030) aims to restore 97 micro-watersheds across Khyber Pakhtunkhwa through community-driven watershed rehabilitation, afforestation, climate-smart agroforestry, water harvesting, and eco-enterprise development. It integrates structural and biological measures to reduce flood risks, improve ecosystem services, and strengthen livelihoods.	KPK	$285.00
2	**Solarization of Sehat Kahani E-Clinics for Climate Impact and Healthcare Democratization**	Sehat Kahani is a health tech impact initiative that aims to reduce climate impact and democratize healthcare, especially for underserved and marginalized communities. The platform reintegrates female doctors into the medical workforce using telemedicine.	Pakistan	$3.00
3	**The Earthback Project**	The Earthback Project aims to restore 10,000 acres of degraded farmland in Pakistan by applying high-quality compost to smallholder farmers. In the first year, compost will be provided at subsidized rates backed by interested businesses to encourage adoption, with full-fledged adoption in later years as farmer confidence grows.	Sindh and Punjab	$1.00
		Early Stage Projects		
1	**Command Area Development of Small Dams/Canal**	Establishment of tertiary irrigation systems and improved/sustainable agriculture practices on farmers' lands	KPK	$45.00
2	**Water Security in Context of Climate Change Vulnerabilities**	This project aims to increase the storage capacity of irrigation water and will also monitor the annual melting of snow and glaciers due to rapid climate change in the region. The project will also lay the foundation for a focused, interdisciplinary approach to safeguarding mountain water systems	Gilgit-Baltistan	$7.50
3	**Integrated Soil and Water Conservation Interventions**	The project aims to address issues through proven measures, including terrace development, check dams, water ponds, streambank stabilization, micro-watershed management, and low-cost agronomic practices. These interventions will protect farmland, reduce erosion, enhance groundwater recharge, and improve water availability	KPK	$7.15


Photo credit: Man on a cart with crops in Nowshera, Khyber Pakhtunkhwa, Pakistan, September 2021| Umer Awan PK | Pexels

4	**Landslide & Avalanche Early-Warning System**	This project aims to establish a comprehensive early warning system (EWS) for landslides and avalanches across the Hindu Kush Mountain belt in Khyber Pakhtunkhwa (KPK). The region's steep terrain and changing climate have led to frequent slope failures that imperil remote communities.	KPK	$1.60

5. INCREASING ACCESS TO FINANCIAL PROTECTION

No. of Projects: 4 | Amount: US$ 121.45

SR	TITLE	OVERVIEW	LOCATION	FUNDING NEEDS IN $M
		Procurement Ready Projects		
1	**Emerging Pakistan Green Fund**	The Emerging Pakistan Green Fund is the country's first debt/hybrid green investment fund, focusing on both SMEs and non-SMEs. It targets transformative investments across renewable energy, energy efficiency, sustainable transport, green buildings, agriculture/forestry, water & waste management.	Pakistan	$50.00
		Early Stage Projects		
1	**Accelerating Low-Carbon Emission Investment in MSME Sector**	This project is specifically designed to catalyze green investments in Pakistan's MSME sector by enabling access to low-carbon technologies and sustainable practices. It targets environmental sustainability, energy efficiency, and reduced greenhouse gas (GHG) emissions by facilitating access to finance, particularly for underserved MSMEs. The program helps MSMEs transition to clean technologies by addressing critical barriers such as high upfront costs and limited financial inclusion.	Pakistan	$50.00
		Concept Ready Projects		
1	**Climate Shield Risk Insurance & Guarantee Fund**	Community-based insurance & guarantee fund to protect households in 16 GLOF valleys, covering lives, assets, and livelihoods.	Gilgit-Baltistan	$18.45
2	**Pakistan Green Impact Bond for Climate-Smart Enterprises**	The proposed Green Impact Bond (GIB) will support investments in critical green sectors, including waste management, plastic recycling, clean air technologies, water efficiency, and sustainable agriculture.	Pakistan	$3.00

6. PROTECTING NATURAL CAPITAL THROUGH NATURE-BASED SOLUTIONS

No. of Projects: 12 | Amount: US$ 275.14

SR	TITLE	OVERVIEW	LOCATION	FUNDING NEEDS IN $M
		Procurement Ready Projects		
1	**Carbon Offset through Afforestation, Reforestation, and Revegetation (ARR)**	A large-scale Afforestation, Reforestation, and Revegetation (ARR) initiative focused on restoring mangrove ecosystems across 34,351 ha in Gwadar and Lasbela districts, Balochistan. The project will sequester ~11.2 million tCO2e over 30 years.	Balochistan	$30.00
2	**Development of Ski Resorts**	Establishment of seasonally reliable ski resorts to expand winter tourism, create jobs, and boost community income.	Chilim Valley, Deosai Plains, Gilgit-Baltistan	$43.00
3	**Transforming Barren Lands into Climate-Resilient Prosperity**	This project seeks funding to expand land development on barren lands of Gilgit-Baltistan, building on the foundation of the Economic Transformation Initiative (ETI-GB). ETI has developed over 50,000 acres of new land through irrigation. Over 18,000 acres have already been irrigated and cultivated, achieving strong returns.	Gilgit-Baltistan	$25.00
4	**Nysa Eco-Resort**	The proposed Eco-friendly resort combines modern and traditional construction, utilizing local materials to preserve cultural aesthetics while reducing transportation and conventional concrete costs, thereby decreasing the construction carbon footprint.	Gulmit, Hunza, Gilgit-Baltistan	$2.57
5	**Nature-Based Solutions for Climate Resilience, Land Degradation Control, and Livelihood Security (Phase-II Green Balochistan Initiative).**	The project aims to restore the ecological productivity of Balochistan's rangelands and expand climate-resilient agroforestry systems as part of an integrated, nature-based climate solution. By embedding community integration at the core, the initiative will enhance climate adaptation through diversified and sustainable livelihoods, while also delivering measurable contributions to Pakistan's NDC mitigation and resilience targets.	Balochistan	$51.30
		Early Stage Projects		
1	**Carbon Sequestration through Fruit Orchard Development**	This project aims to establish and expand fruit orchards of diverse species (e.g., olive, citrus, peach, apple, apricot, walnut, and pomegranate) across suitable agro-climatic zones of Khyber Pakhtunkhwa (KP).	KPK	$17.90

2	**Coastal Aquaculture & Carbon Sequestration through Seaweed and Shellfish Farming**	This project will establish seaweed (Kappaphycus, Gracilaria) and shellfish (mussels, oysters) farms along the Balochistan coast. The initiative enhances food security, reduces fishing pressure, sequesters carbon, improves marine biodiversity, and opens access to the growing carbon credit market.	Jiwani, Pasni, and Gwadar, Balochistan	$7.00
3	**Climate-Resilient Cultivation & Value-Chain Development of Medicinal and Aromatic Plants**	This project aims to scale up the commercial cultivation and value-chain development of medicinal and aromatic plants (MAPs) in Gilgit-Baltistan. With its rich biodiversity and favorable climate, the region is ideally suited for high-value species such as wild garlic, cumin, rhododendron, hing, bergenia, and artemisia. The initiative supports sustainable livelihoods, strengthens climate resilience, and unlocks export potential by tapping into the growing global demand for natural and herbal products.	Gilgit-Baltistan	$6.00
4	**Establishing a Designated Operational Entity (DOE) for Voluntary Carbon Markets**	The project aims to establish Pakistan's first locally domiciled Designated Operational Entity (DOE) accredited under UNFCCC Article 6.4. This DOE will provide independent validation, verification, and monitoring of carbon projects, ensuring compliance with international standards.	Pakistan	$1.00
5	**Building Climate-Resilient Agriculture: Innovation, Water, and Markets**	The project aims to strengthen the market linkage and increase the 20% market share of identified agricultural/horticultural products from Balochistan.	Balochistan	$87.36
	Concept Ready Projects			
1	**Mango Agroforestry Carbon Project**	Pilot study on agroforestry model combining mango orchards with short-cycle crops. This can provide benefits related to income diversification, carbon sequestration, soil stability, water management, biodiversity gains, and long-term resilience.	Mirpurkhas, Sindh	$0.01
2	**Boat Upgradation with Longlining & Freezing Units**	This project will retrofit fishing vessels in Balochistan with longlining systems for tuna and large pelagics, onboard freezing plants, and HACCP-compliant handling practices.	Gwadar, Lasbella and Hub, Balochistan	$4.00

Photo credit: Freepik

7. EV INDUSTRY & TRANSPORT

No. of Projects: 9 | Amount: US$ 559.73

SR	TITLE	OVERVIEW	LOCATION	FUNDING NEEDS IN $M
		Procurement Ready Projects		
1	Economia Manufacturing Project	Economia, a project of AGECO (Pvt.) Ltd. aims to establish a large-scale manufacturing setup for solar-powered electric vehicles (SEVs) and retrofitting kits (including PMDC motors and Li-ion batteries) in Pakistan. The initiative reduces reliance on fossil fuels, addresses rising oil import costs, and lowers public transport expenses.	Industrial Zone, Rawalpindi/ Islamabad	$220.00
2	EV Retrofitting Project	The proposed project is for a manufacturing setup to produce retrofitting kits (including Permanent Magnet DC motors and lithium-ion batteries) for existing ICE vehicles.	Pakistan	$120.00
3	Nationwide Electric Vehicle Charging Network (EVCN)	This initiative seeks to remove infrastructure barriers to electric mobility, stimulate private investment, reduce dependence on imported fossil fuels, and achieve measurable reductions in greenhouse gas emissions. The EVCN will scale from the current baseline of approximately 100 chargers to more than 1,000 charging stations nationwide by 2030, strategically deployed along national highways, economic corridors, and major urban centers.	Pakistan	$75.00
4	Electric Mobility as a Service (EMaaS)	The project aims to provide and enhance rent-free EVs with battery swapping and solar integration for urban transport.	Pakistan	$45.50
5	Manufacturing of Electric Vehicles	LEO Automobiles (Pvt.) Ltd. aims to design, develop, and launch an electric quadricycle, the first of its kind in Pakistan, followed by hatchbacks and minivans.	Lahore, Punjab	$1.36
6	ECODOST Electric Bike	Featuring advanced Lithium-Iron Phosphate Battery technology, the project aims to reduce carbon emissions and Pakistan's fuel import dependency.	Karachi, Sindh	1M
7	Operating Electric Vehicles in Central Business District (CBD)	The project introduces electric buses to operate along key routes in Quetta's Central Business District, aiming to reduce urban air pollution, cut greenhouse gas emissions, and provide affordable, modern public transportation.	Quetta, Balochistan	$18.00

Photo credit: Plastic bottles collected for recycling in Lahore, Punjab, Pakistan, March 2024 | Dariph | Shutterstock

Concept Ready Projects				
1	**Green Government Fleet Pakistan (GGFP)**	The project aims to electrify public transportation in the public sector to reduce greenhouse gas (GHG) emissions and improve air quality in major cities across Pakistan.	Pakistan	$67.32
2	**Pakistan NEV Ecosystem Program**	The Pakistan NEV Ecosystem Program is a national initiative designed to accelerate the adoption of new energy vehicles (NEVs) and the development of requisite charging infrastructure through a structured, finance-driven approach. It is aligned with NEV's Policy.	Pakistan	$11.55

8. BUILDING A CIRCULAR ECONOMY

No. of Projects: 13 | Amount: US$ 1,233.86

SR	TITLE	OVERVIEW	LOCATION	FUNDING NEEDS IN $M
		Procurement Ready Projects		
1	Wastewater Treatment Plant (WWTP)	The sewage treatment project aims to implement a comprehensive wastewater management system to prevent pollution and protect the environment. This initiative not only addresses public health concerns but also promotes sustainability by recycling waste and contributing to a circular economy.	Lahore, Punjab	$405.00
2	Punjab Recycling Parks Package -10 Plants	The Punjab Recycling Parks Package aims to develop 10 recycling and waste-to-resource plants across Punjab (total 5,000 TPD capacity) under a PPP + EPC (BOOT) model to ensure efficient resource recovery and reduced GHG emissions.	Punjab	$350.00
3	Mainstreaming Refill Stations for Plastic Avoidance	The project aims to create a supply chain of refill and reuse consumer products through community partner stores and refill stations developed by Davaam Life.	Karachi, Lahore and Islamabad	$1.00
4	Integrated Solid Waste Management Project	Transforming Quetta's existing solid waste management into a fully Integrated Model that includes: • Transporting the Daily Generation of waste to the Landfill • Door-to-Door Collection • Waste Diversion from Landfill for recycling purposes	Quetta	$28.00
5	Recycling and Management of Textile Waste	The proposed project aims to utilize post-consumer textile waste generated by the textile sector in Pakistan. A study indicates that approximately 270,125.34 metric tons of textile waste are produced, including 19,304.58 metric tons specifically from Karachi.	Punjab	$20.00
6	Rehabilitation of Mehmood Booti Dumpsite into Urban Forest & Solar Park	Transform Lahore's oldest landfill (closed 2016) into a 31-acre urban forest and 5 MW solar park, with full capping, gas recovery, and leachate treatment.	Lahore, Punjab	$12.00

7	**Biowaste Energy Ventures Ltd. (BEVL)**	The project aims to transform organic waste into biomethane, bio pellets, and compost.	Sindh, Pakistan	$11.10
8	**Irverde Gogreen Zero Waste Solutions**	The project aims to deliver zero-waste solutions for all waste streams, including hard-to-recycle materials. The project also aims to help corporates and industries meet rising sustainability and compliance demands in a fast-growing market.	Pakistan	$0.35
9	**Punjab Landfill Valorization Program**	The Punjab Landfill Valorization Program scales the Lakhodair gas-to-carbon pilot across 141 dumpsites, generating 2.5–3.0M tCO_2e credits, 200–250M m^3 RNG, and USD 400–550M annual revenue, unlocking over USD 1B investment and positioning Punjab as South Asia's first carbon valorization hub.	Punjab	$350.00
10	**500 TPD City Composting Facility**	The project is a 500 TPD city-scale composting facility that aims to process the organic fraction of municipal solid waste (MSW) into high-quality compost for agricultural and landscaping use. It aims to divert waste from open dumps, mitigate methane emissions, improve soil health, and generate carbon credits.	Punjab	$25.00

Photo credit: Freepik

Early Stage Projects				
1	**Climate-Smart Fish Feed & Circular Economy Innovation**	The project aims to establish feed mills using mesopelagic fish, seaweed, and agri-waste; promote Biofloc aquaculture systems	Gwadar, Hub and Pasni, Balochistan	$7.00
2	**Bio-LNG**	The project involves setting up Pakistan's first bio-LNG plant, processing organic waste through anaerobic digestion, upgrading it to biomethane, and liquefying it into bio-LNG. With a capacity of 20 tons/day, it will serve industries such as textiles, cement, fertilizer, ceramics, as well as housing colonies.	Sargodha, Punjab, Punjab	$24.40
Concept Ready Projects				
1	**Biogas Project**	Pilot study aiming to use biodigesters to convert dung into biogas for households/industries, and bio-compost for farmers.	Nowshera District, KPK	$0.01

B. KEY CLIMATE CHANGE STRATEGIES AND INSTITUTIONS IN PAKISTAN

KEY STRATEGIES AND PLANS	COVERAGE
National Climate Change Policy	The National Climate Change Policy (NCCP) was originally published in 2012 and updated in 2021. The NCCP presents Pakistan's climate policy challenges and priorities, outlines the institutional framework and implementation arrangements, and establishes the monitoring and evaluation framework for the NCCP. The NCCP is supported by the Framework for Implementing Climate Change Policy.
Nationally Determined Contributions (NDC)	A revised NDC was submitted in 2025, which commits to a 50% reduction in emissions compared to the Initial NDC projection by 2035. The NDC covers climate adaptation and mitigation and includes cost estimates across key sectors.
National Biodiversity Strategy and Action Plan (NBSAPs)	NBSAPs provide a roadmap for countries in addressing existing threats to biodiversity. They also ensure their conservation and sustainable usage. Pakistan's current NBSAP 2017-2030 is developed to implement international biodiversity standards. The NBSAP comprises 74 proposed actions across five strategic goals and 20 ABTs requiring $74.8 million.

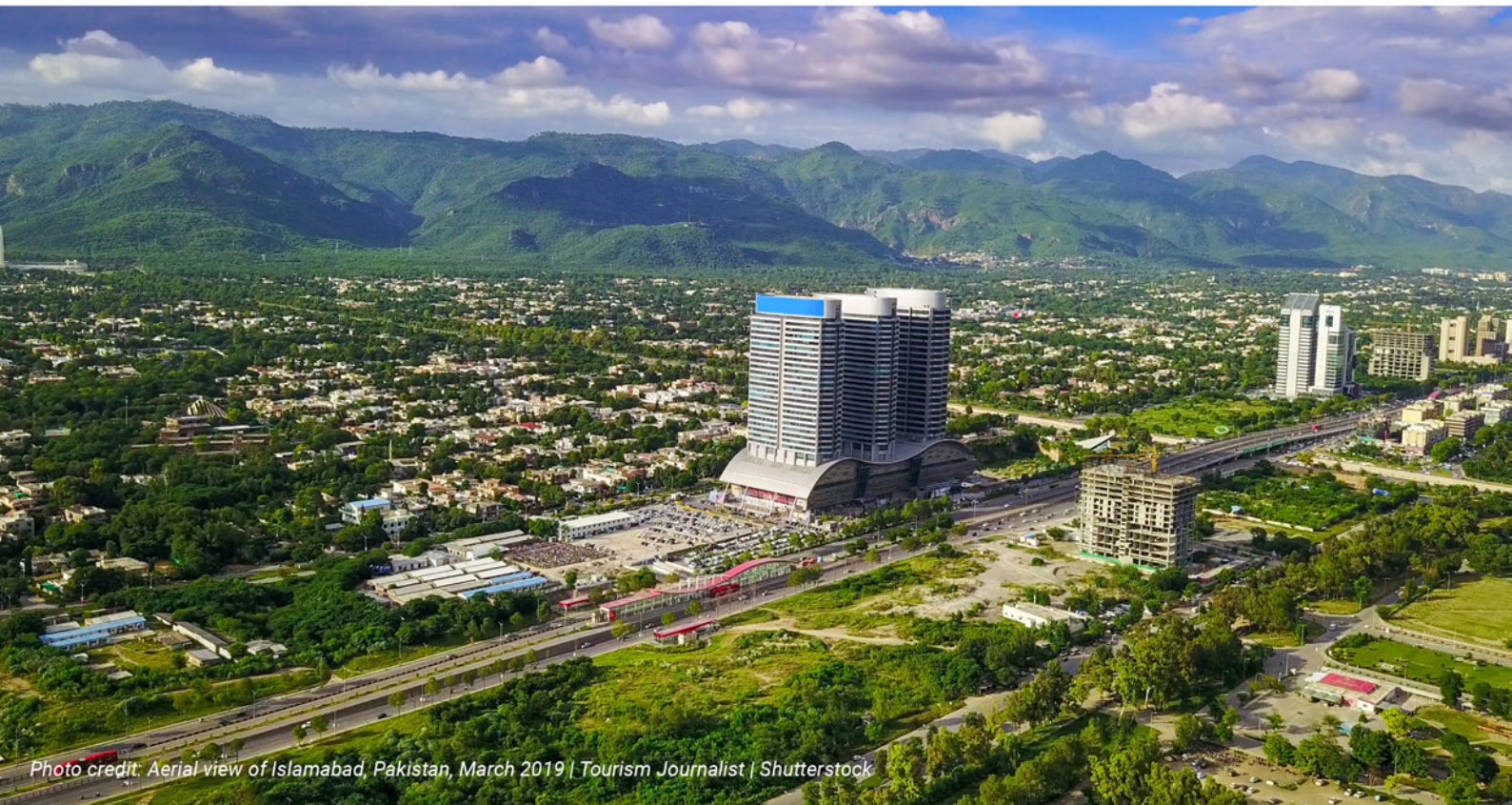


Photo credit: Aerial view of Islamabad, Pakistan, March 2019 | Tourism Journalist | Shutterstock

Vision 2025	Pakistan's 'Vision 2025' was formulated in 2024 and is the country's most recent long-term strategic plan developed by the government of Pakistan. Vision 2025 outlines specific steps the government plans to take regarding climate change actions, including setting emission goals and emphasizing the importance of resilience and adaptation, as well as incorporating an inclusive methodology into the overall process.
Sector Plans and Policies	Specific sectoral policies address climate change include: the National Electric Vehicle Policy (2019), Alternative and Renewable Energy Policy (2019), Transport Sector Policy (2018), National Electricity Policy (2021), National Water Policy (2018), National Forest Policy (2017), Pakistan's National Food Security Policy (2018), the National Clean Air Policy (2023), and the Strategic Plan for Energy Efficiency & Conservation (2020-2023), National Climate Finance Strategy (2024), National Adaptation Plan (2023), Pakistan Policy Guidelines for Trading in Carbon Markets (2024).
National Disaster Management Plan	The National Disaster Management Plan and the 2019 National Disaster Response Plan provide the overall strategy and guiding principles for Pakistan's disaster risk reduction and management agenda. The Plan also outlines an institutional framework across the government and its operations system, as well as an implementation plan.
Pakistan Green Taxonomy (PGT)	Launched in 2023, the Pakistan Green Taxonomy is a classification system developed by SECP and the Ministry of Climate Change and Environmental Coordination to define environmentally sustainable economic activities. It guides public and private investors by setting technical screening criteria across sectors like energy, transport, and agriculture, aligned with climate mitigation, adaptation, and SDGs. The Taxonomy supports green finance instruments such as green bonds and sukuk, and aims to direct capital toward Pakistan's low-carbon and climate-resilient development.
Uraan: The 5E National Economic Transformation Plan	A 5-year National Economic Transformation Plan (2024-29) focused on the "Five Es" framework: Exports, EPakistan, Equity and Empowerment, Environment and Food Security, and Energy and Infrastructure. Key objectives include achieving a 6% GDP growth rate, creating one million jobs annually, attracting $10 billion in private investment each year, and increasing exports to $60 billion by 2028.

INSTITUTIONS	CLIMATE RELATED RESPONSIBILITIES
National Climate Change Implementation Committee	Pakistan's National Climate Change Policy Implementation Committee is a dedicated body responsible for overseeing the execution of the NCCP. Its primary functions include monitoring the progress of climate change policy implementation, ensuring intersectoral coordination, and addressing any challenges that arise during the execution of the NCCP.
Pakistan Climate Change Council	A Climate Change Council was established under the Climate Change Act of 2017 to ensure inter-ministerial coordination across federal and provincial governments, and to promote public awareness and education on climate change issues. The Council is also responsible for facilitating climate change research and development, as well as monitoring and reporting on the progress of Pakistan's climate change actions.

Ministry of Climate Change & Environmental Coordination	The NCCP envisages the MoCC & EC in Pakistan as the central coordinating body for climate change actions across various sectors. The ministry's role involves formulating climate policies, facilitating the implementation of mitigation and adaptation measures, and ensuring interministerial coordination. In practice, the ministry oversees the execution of climate-related initiatives, develops partnerships with stakeholders, and represents Pakistan's interests in international climate negotiations and forums.
Pakistan Climate Change Authority	The Pakistan Climate Change Authority (PCCA) serves as the primary agency in Pakistan for implementing climate policies, coordinating adaptation and mitigation initiatives, and mobilizing climate finance. It became operational in 2024, with the purpose of embedding climate resilience in all sectors of the economy and ensuring compliance with both national and international commitments. The Authority's effective operation is vital for translating Pakistan's climate vision into tangible actions, shifting the focus from vulnerability to resilience.
Sector Ministries	Under the NCCP, sector ministries are expected to develop and implement climate change mitigation and adaptation strategies tailored to their specific sectors. Sector ministries must ensure interministerial coordination, share best practices, and collaborate with other stakeholders to promote a comprehensive and integrated approach to climate change management in Pakistan.
Ministry of Planning, Development, and Special Initiatives	The Planning Ministry collaborates with the Ministry of Climate Change and other relevant ministries to streamline climate-responsive projects, allocate resources, and monitor the progress of these initiatives.

Photo credit: Fisherman in Kandiaro, Sindh, Pakistan, July 2025 | Saeed Ahmed Abbasi | Pexels

C. COST ASSUMPTIONS

ADAPTATION COST ASSUMPTIONS				
INTERVENTION/INDICATOR	UNIT	TIME		
		2025	2030	2050
Buildings and Roads				
Average cost of flood protection - High	USD/Building	3,506	3,506	3,506
Average cost of flood protection - Low	USD/Building	875.4	875.4	875.4
Average cost of Elevating Floor levels	USD/building	107,000	107,000	107,000
Initial cost of flood protection per km of road	USD/km	50,000	50,000	50,000
Average cost of flood protection per km of road	USD/km	61,165	63,329	63,727
Average cost per AC Unit	USD/unit	400	400	400
Number of AC units per dwelling	Unit/Dwelling	2	2	2
Average cost of retrofitting buildings	USD/Building	500	500	500
Agriculture Adaptation				
Average cost per hectare of drip irrigation	USD/ha	2,000	2,000	2,000
Average cost per hectare of drainage	USD/ha	2,500	2,500	2,500
Average cost per hectare of net shading	USD/ha	25,000	25,000	25,000
Livestock Interventions				
Nature based solution per cattle	USD/head	1.32	1.32	1.32
Nature based solution per poultry	USD/head	.08	.08	.08
Nature based solution per buffalo	USD/head	1.32	1.32	1.32
Nature based solution per sheep and goats	USD/head	.33	.33	.33
Nature based solution per horses	USD/head	1.32	1.32	1.32
Technology based solution per cattle	USD/head	39.42	39.42	39.42
Technology based solution per poultry	USD/head	2.46	2.46	2.46
Technology based solution per buffalo	USD/head	39.42	39.42	39.42
Technology based solution per sheep and goats	USD/head	9.86	9.86	9.86
Technology based solution per horses	USD/head	39.42	39.42	39.42

Cost assumption for GEM - adaptation policies

MITIGATION COST ASSUMPTIONS				
INTERVENTION/INDICATOR	UNIT	TIME		
		2025	2030	2050
NMT Infrastructure				
Cost per km of NMT Infrastructure	USD/km	56,000	56,000	56,000
Annual operational costs per km of NMT Infrastructure	USD/km/year	665	665	665
Energy Efficiency				
Cost per TJ of energy avoided through efficiency	USD/TJ	7,165	7,165	7,165
Cost per CCS per ton of CO2 avoided	USD/ton	80	80	80
Fuel switching				
Cost per TJ of Fuel switched	USD/TJ	3,583	3,583	3,583
Land-based interventions				
Cost per hectare of mangrove restoration	USD/ha	3,000	3,000	3,000
Cost per hectare of reforestation	USD/ha	1,225	1,225	1,225
Livestock interventions				
Cost per ton of CH4 removed from livestock	USD/ton	88	88	88
Cost per ton of N2O removed from livestock biodigester	USD/ton	92	92	92
Cost per ton of N2O removed from livestock pasture	USD/ton	15	15	15
Sustainable Agriculture				
Cost per hectare of sustainable agriculture	USD/ha	476	476	476
Cost per hectare of vertical farming	USD/ha	230,000,000	230,000,000	230,000,000
Annual operational costs per ha of sustainable farming	USD/ha/year	282	282	282
Waste-related interventions				
CAPEX Waste collection	USD/ton	98	98	98
OPEX Waste collection	USD/ton/year	50	50	50
CAPEX waste composting	USD/ton	208	208	208
OPEX waste composting	USD/ton/year	28	28	28
CAPEX waste for energy recovery	USD/ton	642	642	642
OPEX waste for energy recovery	USD/ton/year	40	40	40
CAPEX waste incinerated	USD/ton	321	321	321
OPEX waste incinerated	USD/ton/year	20	20	20
CAPEX waste landfilled	USD/ton	15	15	15
OPEX waste landfilled	USD/ton/year	46	46	46
CAPEX waste recycled	USD/ton	647	647	647
OPEX waste recycled	USD/ton/year	38	38	38
Cost per ton of waste prevented	USD/ton	98	98	98

GEM mitigation cost assumptions all but energy interventions

D. COST-BENEFIT ANALYSIS

DISCOUNTED 7% PER YEAR

CBA INDICATOR	UNIT	UNCONDITIONAL NDC SCENARIO		CONDITIONAL NDC SCENARIO		CPP SCENARIO 2050	
		2025-2030	2025-2050	2025-2030	2025-2050	2025-2030	2025-2050
Investments in transition	**USD million**	**39,955**	**155,478**	**31,466**	**118,381**	**45,409**	**409,590**
Power generation	USD million	16,204	48,323	14,200	50,684	3,887	78,994
Transmission lines	USD million	45	117	37	63	35	282
Energy efficiency	USD million	499	3,752	1,778	6,603	1,359	8,344
Industrial CCS	USD million	0	543	0	766	0	3,224
Fuel switching	USD million	1,109	6,747	835	6,468	913	14,297
Land-based interventions	USD million	107	639	328	911	2,146	4,170
Livestock-related emission reductions	USD million	248	9,962	156	32,738	166	35,246
Sustainable agriculture	USD million	0	0	0	0	3,554	21,567
Waste management	USD million	1,144	5,392	415	4,347	426	5,748
Investment in NMT infrastructure	USD million	0	0	0	0	210	509
Total cost of transport electrification and power generation	USD million	36,803	128,325	27,918	66,485	28,349	232,845
Investment in fast chargers	USD million	2,297	8,217	1,873	4,282	1,910	15,467
Chargers investment	USD million	1,265	3,932	946	2,062	959	7,008
Chargers O&M	USD million	331	2,401	141	1,193	141	3,165
Electric buses	USD million	361	1,226	280	643	284	2,221
Electric vehicles	USD million	32,217	110,211	24,507	57,130	24,883	201,765
O&M electric buses	USD million	42	316	22	159	22	440
O&M EVs	USD million	290	2,021	149	1,017	150	2,780
Investments in climate resilience	**USD million**	**0**	**0**	**0**	**0**	**28,168**	**84,926**
Flood protection (buildings)	USD million	0	0	0	0	1,803	5,079
Drip irrigation	USD million	0	0	0	0	7,031	25,061
Air conditioning	USD million	0	0	0	0	308	868
Drainage systems	USD million	0	0	0	0	8,789	31,326
Road network	USD million	0	0	0	0	12	103
Net shading	USD million	0	0	0	0	7,235	15,833
Retrofitting	USD million	0	0	0	0	193	542

Livestock adaptation	USD million	0	0	0	0	2,190	3,556
Power generation	USD million	0	0	0	0	187	1,467
Transmission lines	USD million	0	0	0	0	2	9
Greening urban areas	USD million	0	0	0	0	3	8
Total cost of water infrastructure	USD million	0	0	0	0	414	1,074
Capital cost freshwater	USD million	0	0	0	0	109	129
O&M cost freshwater	USD million	0	0	0	0	94	538
Capital cost of sewage connection	USD million	0	0	0	0	175	202
O&M cost sewage connection	USD million	0	0	0	0	36	204
Contingency payments	**USD million**	**-1.23**	**113.57**	**-1.23**	**113.57**	**109**	**1,711**
Total investment required	**USD million**	**39,954**	**155,591**	**31,465**	**118,494**	**73,686**	**496,227**
Avoided cost							
Energy bill	USD million	-3,583	16,290	661	33,987	1,519	56,641
Cost of ICE vehicles	USD million	30,527	114,202	23,316	58,720	23,698	209,815
Cost of gasoline infrastructure	USD million	876	3,134	715	1,633	728	5,900
Cost of air pollution	USD million	7,181	76,552	9,527	112,873	7,520	167,587
Cost of air pollution (power)	USD million	-126	-40	155	1,585	361	1,552
Cost of air pollution (final consumption)	USD million	7,307	76,592	9,371	111,288	7,160	166,035
Avoided CC damages	USD million	-2,325	-13,112	-1,610	-13,540	799	3,371
Total avoided cost	**USD million**	**39,857**	**273,617**	**42,135**	**306,547**	**40,767**	**609,882**
Added benefits							
Additional real GDP	USD million	-622	59,108	3,016	116,967	59,681	891,823
Agriculture	USD million	0	0	0	0	14,955	57,550
Industry	USD million	-79	15,681	780	30,358	17,174	290,507
Services	USD million	-543	43,428	2,236	86,608	27,553	543,766
Government revenues	USD million	-185	66,786	1,063	115,512	20,037	820,535
Household savings	USD million	3,537	498,894	10,423	835,407	139,642	5,719,383
Carbon credits	USD million	99	5,769	249	8,643	690	13,582
Total added benefits	**USD million**	**-523**	**64,877**	**3,265**	**125,610**	**60,097**	**905,130**
Net integrated benefits	**USD million**	**-2,732**	**182,903**	**15,100**	**313,663**	**32,835**	**1,128,081**
Ratio avoided cost to investment	USD/USD invested	1.00	1.76	1.34	2.59	0.55	1.23
Ratio added benefits to investment	USD/USD invested	-0.01	0.42	0.10	1.06	0.82	1.82
Ratio avoided costs and added benefits to investment	USD/USD invested	0.98	2.18	1.44	3.65	1.37	3.05
Net investment	**USD million**	**8,551**	**38,255**	**7,434**	**58,141**	**49,259**	**280,512**

UNDISCOUNTED

CBA INDICATOR	UNIT	UNCONDITIONAL NDC SCENARIO		CONDITIONAL NDC SCENARIO		CPP SCENARIO 2050	
		2025-2030	2025-2050	2025-2030	2025-2050	2025-2030	2025-2050
Investments in transition	**USD million**	**58,386.70**	**484,667**	**46,897.42**	**372,137.81**	**40,677.90**	**1,358,234.57**
Power generation	USD million	23,576	134,447	20,917	134,878	5,985	253,397
Transmission lines	USD million	66	310	54	141	33	984
Energy efficiency	USD million	757	13,095	2,687	19,936	981	22,958
Industrial CCS	USD million	0	2,210	0	3,022	0	9,982
Fuel switching	USD million	1,660	22,742	1,290	22,409	641	48,078
Land-based interventions	USD million	158	2,138	478	2,631	2,777	9,365
Livestock-related emission reductions	USD million	381	38,509	267	129,166	0	116,620
Sustainable agriculture	USD million	0	0	0	0	2,623	61,382
Waste management	USD million	1,713	16,574	676	14,847	155	17,772
Investment in NMT infrastructure	USD million	0	0	0	0	191	1,247
Total cost of transport electrification and power generation	USD million	53,651	389,090	41,445	179,985	24,754	813,912
Investment in fast chargers	USD million	3,367	24,995	2,770	11,501	1,682	53,457
Chargers investment	USD million	1,824	11,569	1,392	5,385	880	24,314
Chargers O&M	USD million	493	8,646	220	4,215	89	10,791
Electric buses	USD million	524	3,663	414	1,703	251	7,738
Electric vehicles	USD million	46,944	331,898	36,382	153,129	21,739	706,598
O&M electric buses	USD million	64	1,135	34	552	14	1,511
O&M EVs	USD million	435	7,184	231	3,500	98	9,504
Investments in climate resilience	**USD million**	**0**	**-2**	**0**	**-1**	**23,715**	**209,789**
Flood protection (buildings)	USD million	0	0	0	0	1,641	12,005
Drip irrigation	USD million	0	0	0	0	5,651	64,715
Air conditioning	USD million	0	0	0	0	281	2,052
Drainage systems	USD million	0	0	0	0	7,064	80,894
Road network	USD million	0	0	0	0	10	330
Net shading	USD million	0	0	0	0	6,291	34,606
Retrofitting	USD million	0	0	0	0	175	1,282
Livestock adaptation	USD million	0	0	0	0	2,075	6,813
Power generation	USD million	0	0	0	0	172	4,470
Transmission lines	USD million	0	0	0	0	2	23

Greening urban areas	USD million	0	0	0	0	3	18
Total cost of water infrastructure	USD million	0	-2	0	-1	348	2,582
Capital cost of freshwater	USD million	0	0	0	0	106	218
O&M cost freshwater	USD million	0	-1	0	-1	52	1,473
Capital cost of sewage connection	USD million	0	0	0	0	170	335
O&M cost sewage connection	USD million	0	0	0	0	20	556
Contingency payments	**USD million**	**-1.72**	**558.52**	**-1.72**	**558.52**	**78.59**	**5,371.73**
Total investment required	**USD million**	**58,384.96**	**485,224.54**	**46,895.71**	**372,695.29**	**64,471.16**	**1,573,395.79**
Avoided cost							
Energy bill	USD million	-5,251	96,578	1,114	143,285	148	182,923
Cost of ICE vehicles	USD million	44,839	351,829	34,841	162,044	19,899	738,118
Cost of gasoline infrastructure	USD million	1,284	9,534	1,057	4,387	641	20,390
Cost of air pollution	USD million	10,855	293,935	14,795	428,858	5,108	566,484
Cost of air pollution (power)	USD million	-194	646	215	5,374	378	3,599
Cost of air pollution (final consumption)	USD million	11,050	293,289	14,581	423,485	4,730	562,884
Avoided CC damages	USD million	-3,566	-44,642	-2,522	-47,079	543	8,451
Total avoided cost	**USD million**	**59,017**	**1,001,169**	**64,081**	**1,120,354**	**30,735**	**2,082,137**
Added benefits							
Additional real GDP	USD million	-855	289,625	4,876	503,614	41,023	2,818,929
Agriculture	USD million	0	0	0	0	10,991	148,891
Industry	USD million	-91	75,431	1,262	130,034	9,683	918,456
Services	USD million	-764	214,194	3,614	373,580	20,350	1,751,583
Government revenues	USD million	-256	348,888	1,724	557,339	12,639	2,651,354
Household savings	USD million	5,673	2,540,982	16,785	3,985,777	87,963	18,483,669
Carbon credits	USD million	156	25,910	396	35,604	320	42,463
Total added benefits	**USD million**	**-698**	**315,535**	**5,272**	**539,218**	**41,319**	**2,861,368**
Net integrated benefits	**USD million**	**-66**	**831,480**	**23,706**	**1,288,125**	**7,583**	**3,370,109**
Ratio of avoided cost to investment	USD/USD invested	1.01	2.06	1.37	3.01	0.48	1.32
Ratio added benefits to the investment	USD/USD invested	-0.01	0.65	0.11	1.45	0.64	1.82
Ratio of avoided costs and added benefits to investment	USD/USD invested	1.00	2.71	1.48	4.45	1.12	3.14
Net investment	**USD million**	**12,261.41**	**123,861.60**	**10,997.77**	**206,264.74**	**43,931**	**814,887**

E. LOCAL CURRENCY CAPITAL MARKET DEEPENING

STRATEGIC OBJECTIVES

- **De-risk climate investment:** Provide long-term, fixed-indexed-rate PKR financing to eliminate currency mismatch in large RE, water, transport and resilience projects.
- **Internalize disaster risk:** Develop PKR-settled parametric/sovereign insurance layers, as well as provincial resilience funds, to avoid crisis-time FX drawdowns.
- **Mobilize non-bank capital:** Shift long-dated climate financing toward pensions, insurers, mutual funds, takaful and diaspora investors.
- **Broaden PKR liquidity:** Formalize informal savings (Rotating Savings and Credit Associations/ committees), launch retail green savings channels, and link remittances to investable PKR products.
- **Embed risk-sharing:** Use revenue/inflation-linked PKR notes, state-contingent clauses, and a guarantees/hedging menu to keep the cost of capital competitive.

ACTION AREA	IMPLEMENTATION STEPS	RESPONSIBLE INSTITUTIONS
Sovereign Green/Blue Issuance	• Publish a Sovereign Green/Blue Framework aligned to CPP Use of Proceeds (UoP) and MRV (taxonomy, KPIs). • Launch a programmatic calendar of PKR Green Sukuk/Bonds with reopenings across 5/7/10/15-yr tenors to build benchmark liquidity. • Grant Statutory Liquidity Ratio (SLR) or repo eligibility to qualify sovereign green paper and publish a green yield curve/index.[29]	MoF/Debt Management Offices, State Bank of Pakistan (SBP), Securities and Exchange Commission of Pakistan (SECP), Pakistan Stock Exchange (PSX)
SOE & Corporate PKR Shelves	• Mandate and support SOE green sukuk/bonds (e.g., hydropower/water utilities); standardize issuer templates and disclosures. • Replicate Parwaaz-style[30] PKR green instruments for corporates/DFIs[31] (adaptation, water, agri, transport), so projects can tap domestic investors quickly, repeatedly, and at lower cost. • Provide partial credit guarantees/first-loss to crowd-in insurers/pensions.	MoF, Line Ministries/SOEs, SECP, DFIs/MDBs

[29] SLR and repo eligibility make sovereign green sukuk/bonds high-quality liquid assets for banks and usable collateral for funding, while a published green yield curve/index anchors transparent pricing. Together they lower issuance costs and deepen PKR demand for climate investment.

[30] The Parwaaz Green Action Bond, which is also the first green bond to be listed on the Pakistan Stock Exchange (PSX), is aimed at mobilising PKR 1bn (approx. USD 3.5m) in investment for environmentally sustainable projects and strengthening Pakistan's green investment ecosystem.

[31] This means setting up programmatic, pre-approved issuance platforms in Pakistani Rupees so corporates and development finance institutions can tap the market repeatedly, issuing multiple green bonds/sukuk tranches over 12–36 months and using one base prospectus and standardised docs modelled on the Parwaaz green bond precedent.

Provincial & Municipal Climate Bonds	• Establish sub-national issuance rules (under Art. 167(4)), with a federal liquidity/guarantee window for the first pilots. • Structure pooled bonds for water/drainage/roads using escrowed revenues (tariffs, property/sanitation fees, wheeling charges).	MoF, Provincial Govts, SECP, Auditor-General
Institutional Investor Catalysts	• Adjust pension/insurance regulations (limits, Risk-Based Capital) to favor long-dated green PKR assets; enable green ETFs/index funds. • Set primary-dealer green market-making obligations[32] • Permit green sukuk in takaful solvency buckets with calibrated capital charges	SECP, SBP, MoF, Punjab Pension Fund (PPF) or Employees' Old-Age Benefits Institution (EOBI), Insurance Regulator
Market Infrastructure & Liquidity	• Tag green issues at the ISIN level; expand the PSX Green Board and publish price/volume transparency. • Digitize trading/clearing/settlement; enable triparty repo against green collateral	SECP, PSX, National Clearing Company of Pakistan Limited (NCCPL), SBP
Risk-Sharing, Guarantees & Hedges	• Publish a Guarantees & Hedges Menu (MIGA, IBRD/IDA/ADB/IsDB, GuarantCo, TCX, ALCB, ECAs[33]) • Create a modest FX-risk facility to co-pay hedge/guarantee premia for priority CPP projects	MoF/DMO, SBP, SECP, CPP Country Platform, MDBs/DFIs
Indexed & State-Contingent PKR Designs	• Introduce inflation-/revenue-linked PKR notes (e.g., drainage fees, EV charging receipts) • Standardize disaster "pause", revenue-indexed amortization, and FX-stabilization riders (if any FX leg remains).	MoF, SBP, SECP, Provinces, Issuers
Retail & Inclusion (Informal to Investable)	• Launch Retail Green Savings Certificates[34] (mobile, small tickets) incl. prize-linked options. • Digitize ROSCAs/committees into Green Committee Certificates, which are investable in short-term green T-bills. • Enable MFIs to issue micro-sukuk for rooftop solar/efficient appliances with utility on-bill repayment.	MoF, SECP, SBP, PSX, MFIs, Telcos/EMIs
Diaspora & Remittances	• Issue Diaspora PKR Green Sukuk/Bonds (digital KYC; FX subscription with PKR settlement). • Create Remittance-Linked Green Savings that auto-sweep a % of remittances into PKR green funds/bonds; offer matched incentives via DFIs. • Structure DOST-type friendly-nation bonds with PKR coupon legs.	MoF, SBP, MOPHRD/BOE, Banks/EMIs, DFIs

[32] Designate benchmark green sovereign issues and require primary dealers to provide continuous two-way quotes within set spreads and sizes, creating assured liquidity, transparent pricing, and a lower cost of capital for PKR-denominated climate finance.

[33] MIGA: Multilateral Investment Guarantee Agency (World Bank Group), IBRD: International Bank for Reconstruction and Development (World Bank Group), IDA: International Development Association (World Bank Group), ADB: Asian Development Bank, IsDB: Islamic Development Bank, GuarantCo: GuarantCo Ltd (part of the Private Infrastructure Development Group, PIDG), TCX.

[34] Retail Green Savings Certificates are small-ticket, time-bound savings instruments (e.g., PKR 5k–50k per unit) sold to the public via banks/mobile wallets.

Natural-Asset & Carbon-Linked Finance	• Operationalize the domestic carbon market so RE/afforestation/methane/EE credits generate PKR-settled revenues to support coupons/credit enhancement. Pilot nature-performance or biodiversity-linked bonds (e.g., Indus watershed) with outcome-payer top-ups.	MoCC, MoF, Provinces, SECP, DFIs
Financial Protection in PKR	• PKR-settled parametric covers (flood/heat) under Global Shield; establish Provincial Resilience Funds as local payout vehicles. • Expand micro-insurance (livestock/health/property) in PKR to reduce household FX-driven stress.	MoF, NDRMF, Insurance Regulator, Provinces

STAKEHOLDERS INVOLVED IN THE DEVELOPMENT OF PAKISTAN CLIMATE PROSPERITY PLAN

CORE COORDINATION

CVF-V20 Secretariat

Sara Jane Ahmed (Managing Director)
Hamza Haroon (Regional Director, South Asia)
Zulfiqar Younas (Senior Advisor)
Anam Rathor (Programme Lead, Pakistan)
Haseeb Khan (Project Lead, Climate Prosperity Plan)
Abena Takyiwaa (Director, Country Platforms)
Zeshan Masood (Coordination Officer)
Marzio Colantuoni (Research Associate)
Nazrin Castro (Director, Membership & Partnership Coordination)
Rafael Lemuel Cruz (Analyst, Membership & Partnership Coordination)

Administration & Support Services

Kristoffer Sanchez (Associate, Web and Lead Illustrator)
Red Constantino (Advisor to SG)
Mark Lynas (Advisor to SG)
Paul Robert (Advisor to SG)

Supporting Role with CVFV20 Secretariat

Andrea Bassi, Founder and CEO, KnowlEdge Srl
Edvin Andreasson, Junior Project Manager, KnowlEdge Srl

FEDERAL GOVERNMENT MINISTRIES

Ministry of Finance

Muhammad Aurangzeb (Minister for Finance & Revenue)
Bilal Azhar Kiyani (Minister of State for Finance)
Imdad Ullah Bosal (Finance Secretary)
Saira Najeeb, Additional Secretary (EF)
Nadeem Ahsan (Joint Secretary EF)
Muhammad Asif (SA to Minister for Finance)
Mariyum Ayub (Deputy Secretary)
Faisal Wali Jan (Section Officer)

Ministry of Climate Change & Environmental Coordination (MoCC & EC)
Ministry of Planning, Development & Special Initiatives (MoPDSI)
Ministry of Energy (Power Division)
Ministry of Foreign Affairs (MoFA)

FEDERAL, PROVINCIAL AUTHORITIES & TECHNICAL AGENCIES

Pakistan Climate Change Authority (PCCA)
Economic Affairs Division
National Energy Efficiency & Conservation Authority (NEECA)
Public Private Partnership Authority (P3A)
Pakistan Council of Research on Water Resources (PCRWR)
Global Climate Change Impact Studies Centre (GCISC)
Special Investment Facilitation Council (SIFC)
Public Private Partnership Authority, Government of Balochistan
Public Private Partnership Unit, Government of Sindh

PROVINCIAL GOVERNMENTS & DEPARTMENTS

Governments of Punjab, Sindh, Khyber Pakhtunkhwa, Balochistan, Gilgit Baltistan, and Azad Jammu & Kashmir
P&D Departments of Punjab, Sindh, KPK, GB, and Balochistan
Fisheries & Coastal Development Department (Balochistan)
Green Balochistan Initiative (GBI)
Department of Tourism & Culture (GB)
Water and Sanitation Agency (WASA Punjab)
Lahore Waste Management Company (LWMC)

PUBLIC FINANCIAL & DEVELOPMENT INSTITUTIONS

State Bank of Pakistan
EXIM Bank
Zarai Taraqiati Bank Limited (ZTBL)
HBL Zarai (Pvt.) Ltd.
Karandaaz (Pvt.) Ltd.
GIZ Pakistan (NDC Assist II)
UNIDO Pakistan (PFAN)
Aga Khan Rural Support Programme
JS Bank Limited
Infrazamin
National Credit Guarantee Company Limited (NCGCL)

PRIVATE SECTOR & PROJECT DEVELOPERS

Keenjhar Renewable Energy (Pvt.) Ltd.
AGECO (Pvt.) Ltd.
NeuBolt Energy Services (Pvt.) Ltd.
LEO Automobiles (Pvt.) Ltd.
Nova Mobility (Pvt.) Ltd.
Digital Dera (Pvt.) Ltd.
Biowaste Energy Ventures (Pvt.) Ltd.
Irverde Gogreen (Pvt.) Ltd.
Machvista Engineering (Pvt.) Ltd.
Nysa Studios (Pvt.) Ltd.
Sehat Kahani (Pvt.) Ltd.
TrashIt (Pvt.) Ltd.
Wahdat Poultry Farm (Pvt.) Ltd.
Davaam (Pvt.) Ltd.
Resource Future (Pvt.) Ltd.

NON-GOVERNMENTAL & CIVIL SOCIETY ORGANIZATIONS

Sarhad Rural Support Programme (SRSP)
Gilgit Baltistan Rural Support Programme (GBRSP)
Pakistan Agriculture Coalition (PAC)
Pakistan China Institute (PCI)
Pakistan Business Council (PBC)
Sustainable Development Policy Institute (SDPI)
Institute of Regional Studies (IRS)

ACADEMIC & RESEARCH INSTITUTIONS

Lahore University of Management Sciences (LUMS)
Karakoram International University (KIU), Gilgit
National University of Sciences and Technology (NUST)

NATIONAL COUNCILS, BOARDS & ASSOCIATIONS

Federation of Pakistan Chambers of Commerce & Industry (FPCCI)
Board of Investments (BoI)
All Pakistan Fruit & Vegetable Exporters, Importers & Merchants Association (PFVA)

MINISTRY OF FINANCE
GOVERNMENT OF PAKISTAN

CVF V20
CLIMATE VULNERABLE FORUM
VULNERABLE TWENTY GROUP