ASIAN INFRASTRUCTURE INVESTMENT BANK

November 19, 2025

Sovereign-backed Financings

Approval Project Document

P000972 Pakistan: Pakistan Sustainable and Climate-Resilient Infrastructure Guarantee

Indicative approval route: Board
Exceptions to delegation triggered:
- The amount of the Bank's economic capital utilized by the Bank's financing in the project is in excess of USD37.5 million.
- A project which directly implicates the Operational Policy on International Relations.

Currency Equivalents

(As at date, April 30, 2025)

Currency Unit – Pakistani Rupee (PKR)
USD1.00 = PKR280.6000
USD1.00 = CNY7.20

Fiscal Year

July 1-June 30

Abbreviations

ADB	Asian Development Bank
AFDB	African Development Bank
AGP	Auditor General of Pakistan
AIIB	Asian Infrastructure Investment Bank
AMI	Advanced Metering Infrastructure
AMS	Advanced Metering System
APMS	Asset Performance Monitoring System
AR5	The Fifth Assessment Report of the International Panel on Climate Change
AR6	The Sixth Assessment Report of the International Panel on Climate Change
BB1	Building Block 1
BB2	Building Block 2
CCXI	China Chengxin International Credit Rating Co., Ltd.
CDA	Capital Development Authority
CFSS	Sovereign Sustainable Finance Committee
CIBM	China Interbank Bond Market
CMIP	Coupled Model Intercomparison Project
CNY	Chinese Yuan
CRA	climate risk and adaptation assessment
CT	Computed Tomography
CWG	Central Working Group
DISCOs	Electricity Distribution Companies
DMO	Debt Management Office
E&S	Environmental and Social
EFF	Extended Fund Facility
EPC	Engineering, Procurement and Construction
ERP	Enterprise Resource Planning
ESEL	Environmental and Social Exclusion List
ESIA	environmental and social impact assessment
ESMP	Environmental and Social Management Plan
ESP	Environmental and Social Policy
ESS	Environment and Social Standard
FM	Financial Management
FX	Foreign Exchange
FY	Financial Year
GBV	Gender Based Violence
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	Geographic Information System
GOP	Government of Pakistan

GRM	Grievance Redress Mechanism
HVAC	Heating, Ventilation, and Air Conditioning
IBIS	Indus Basin Irrigation System
ICMA	International Capital Market Association
ICT	Information and Communications Technology
IFB	Invitations for Bids
IFC	International Finance Corporation
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
IPSAS	International Public Sector Accounting Standards
IRSA	Indus River System Authority
JMCRC	Jinnah Medical Complex and Research Center
JMCRCC	Jinnah Medical Complex and Research Center Company
LESCO	Lahore Electric Supply Company
LTS	Long-Term Strategy
MDB	Multilateral Development Bank
MFF	Multi-tranche Financing Facility
MOCC&EC	Ministry of Climate Change and Environmental Coordination
MOE	Ministry of Energy
MOF	Ministry of Finance
MONHSRC	Ministry of National Health Services, Regulations and Coordination
MOPDSI	Ministry of Planning, Development & Special Initiatives
MOWR	Ministry of Water Resources
MRI	Magnetic Resonance Imaging
NAFMII	National Association of Financial Market Institutional Investors
NCCP	National Climate Change Policy
NDC	Nationally Determined Contributions
NEPRA	National Electric Power Regulatory Authority
NESPAK	National Engineering Services Pakistan
NRA	Non-resident Account
O&M	Operations and Maintenance
OPIR	Operational Policy on International Relations
PBOC	People's Bank of China
PDG	Partial Debt Guarantee
PET-CT	Positron Emission Tomography–Computed Tomography
PIMS	Pakistan Institute of Medical Sciences
PIU	Project Implementation Unit
PKR	Pakistan rupee
PMOF	Ministry of Finance, Pakistan
POM	Project Operations Manual
PPE	Property, Plant, and Equipment
PPM	Project-affected People's Mechanism
PPRA	Pakistan Federal Government's Public Procurement Regulatory Authority
PSDP	Public Sector Development Program
PSFF	Pakistan's Sustainable Finance Framework
RAP	Resettlement Action Plan
RCP	Representative Concentration Pathway
RMF	Result Monitoring Framework
RSF	Resilience and Sustainability Facility
S&P	Standard and Poor's
SBP	State Bank of Pakistan
SC	Specific Criteria
SDG	Sustainable Development Goal
SEPCO	Sukkur Electric Supply Company
SFR	Sustainable Financing Register

SHCH	Shanghai Clearing House
SIA	Subproject Implementation Agencies
SPO	Second Party Opinion
SPS	Safeguard Policy Statement
SSP	Shared Socioeconomic Pathway
T&D	Transmission and Distribution
UN	United Nations
UOP	Use of Proceeds
WAPDA	Water and Power Development Authority
WHO	World Health Organization

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1. Context

1.1 Country and Macroeconomic Overview. Pakistan is a lower-middle-income economy with a gross domestic product (GDP) per capita of approximately USD1,600 (around USD7,000 in purchasing power parity terms) and a population of around 240 million. Pakistan's economy grew at an average annual rate of 3.5 percent over the past decade, lagging among regional peers due to structural issues such as low investment, including in human capital, low productivity and chronic fiscal challenges.

1.2 Between mid-2021 and mid-2023, macroeconomic imbalances increased rapidly, caused by external and domestic shocks, as well as policy missteps. This led to a large current account deficit, depletion of foreign exchange (FX) reserves and a sharp depreciation of the currency and high inflation, which peaked at above 30 percent. Delays in the International Monetary Fund (IMF) program, persistent fiscal slippage, and public remarks about a possible debt restructuring unsettled markets, resulting in a sharp slowdown in external financing, a sovereign downgrade to the CCC range and a surge in yields.

1.3 Since mid-2023, Pakistan has been working with the IMF and other official financing partners to stabilize the economy. The current USD7 billion Extended Fund Facility (EFF) program focuses on restoring macroeconomic stability and advancing structural reforms. In May 2025, a USD1.4 billion Resilience and Sustainability Facility (RSF) program was approved to enhance resilience against climate risks and natural disasters. Progress under the EFF program has been strong: Pakistan has met key fiscal and reserve targets and successfully completed the first EFF review in May 2025. These achievements boosted investor confidence, reflected in narrowing international borrowing spreads and successive sovereign rating upgrades. In 2025, all three major rating agencies revised Pakistan upward: Fitch and Standard and Poor's (S&P) to B- with a positive outlook, and Moody's to Caa1 with a stable outlook) (Annex 4).

1.4 Industry overview. Filling funding gaps in sustainable and climate-resilient infrastructure in the Government of Pakistan's prioritized sectors.

1.4.1 **The GOP's experience with foreign currency bonds**. In recent years, Pakistan has issued a range of foreign currency bonds, including Eurobonds and sukuk, to meet its external financing needs. As of June 2025, Pakistan's total outstanding international bonds and sukuk amounted to approximately USD6.8 billion, accounting for around 6.8 percent of its public external debt. Notably, Pakistan repaid a USD1 billion Eurobond in April 2024, which was part of a 10-year bond issued in 2014. The next significant repayments are also two Eurobonds: a USD500 million bond matured in September 2025, followed by a USD1.3 billion bond maturing in April 2026.[1]

1.4.2 **Pakistan is extremely vulnerable to climate change.** According to the Intergovernmental Panel on Climate Change (IPCC), Pakistan ranks among those most severely affected by extreme weather events, shifting rainfall patterns, and rising temperatures.[2] The devastating 2022 floods exemplified the increasing intensity and

[1] Government of Pakistan. Ministry of Finance, 2025 *Pakistan Economic Survey 2024-2025*. Islamabad.
[2] Intergovernmental Panel on Climate Change (IPCC). *Climate Change 2022: Impacts, Adaptation and Vulnerability*. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel for Climate Change. H.-O. Pörtner, D.C. Roberts, M. Tignor, et al. (eds.). 2022. Cambridge UK and New York: Cambridge University Press. Link.

frequency of climate-induced shocks and natural disasters. The World Bank estimates that Pakistan will require approximately USD348 billion in total investment between 2023 and 2030 to effectively address its climate challenges.[3] This underscores the urgent necessity for substantial investment in climate-smart and resilient infrastructure. Strengthening infrastructure resilience is critical both to mitigate these escalating risks and to safeguard Pakistan's economic recovery and long-term development prospects.

1.4.3 In response to the severe climate change situation and the significant funding gap that Pakistan is confronting, the GOP developed the country's first Sustainable Financing Framework in 2025 (PSFF) to boost the financing to be raised from domestic and international capital market investors on developing sustainable and climate-resilient infrastructure.

1.4.4 The PSFF was developed in accordance with the International Capital Market Association (ICMA) Green Bond Principles 2021, ICMA Social Bond Principles 2023, Sustainability Guidelines 2021, Loan Market Association Green Loan Principles 2025, and Social Loan Principles 2025. Under the PSFF, Pakistan, acting through the Ministry of Finance, can issue green, social, sustainability or thematic bond(s), Sukuk(s), loans, and any other types of debt instruments (collectively sustainable debt Instruments). Thematic issuance refers to blue, gender, or other types of thematic labels focusing on specific environmental, social, or sustainability objectives. The PSFF also takes into consideration the guidelines for Blue Bonds outlined in the Blue Finance Guidelines published by the International Finance Corporation (IFC) and the Practitioner's Guide for Bonds to Finance the Sustainable Blue Economy published by ICMA, the IFC, the United Nations (UN) Environment Programme Finance Initiative, the UN Global Compact, and the Asian Development Bank (ADB). Sustainable Fitch has provided a Second Party Opinion (SPO) on the PSFF to verify its alignment with international standards.

1.4.5 **The GOP has been striving for diversification of its external funding sources.** Limited access to international financing remains a key constraint to Pakistan's ability to upgrade critical infrastructure and public services to meet the demand of its growing population and increasing climate change risks. GOP's lending from the domestic banking sector has significantly increased; as of June 2025, public sector debt in Pakistan was PKR 80.5 trillion accounted and Pakistan's debt-to-GDP ratio stood at 70.2 percent of GDP, substantially higher than that of regional peers, such as Bangladesh (39.2 percent) and Nepal (50.4 percent).[4] In addition, 68 percent of total public debt was denominated in local currency and came primarily from domestic sources.[5]

1.4.6 According to the IMF's last review, the GOP's access to commercial financing will remain limited and the Project, a small "Panda Bond" issuance, is supportive to its restoration of policy credibility.[6] During a meeting between the IMF and the joint Asian Infrastructure Investment Bank (AIIB) and ADB mission on August 12, 2025 in Islamabad,

[3] World Bank. 2022. *Pakistan – Country Climate and Development Report* (English).
[4] International Monetary Fund (IMF). *Data Mapper: General Government Gross Debt*. 2025.
[5] Another 21 percent was denominated in US dollars, and the remainder comprised of Special Drawing Rights (8 percent), Japanese yen, (2 percent), and other currencies (3 percent). Source: Ministry of Finance 2025. Semi-Annual Public Debt Bulletin (July-December 2024).
[6] International Monetary Fund (IMF) 2025. First Review Under the Extended Arrangement Under the Extended Fund Facility, Requests for Modification of Performance Criteria, and Request for an Arrangement Under the Resilience and Sustainable Facility – Press Release; Staff Report; And Statement by the Executive Director for Pakistan. *IMF Country Report No. 25/109*.

the IMF reaffirmed its view that the planned Panda Bond issuance will contribute to the diversification of the Pakistan's funding sources. The successful issuance of the Bond would serve both as a positive market signal and as support for debt sustainability through improved financing conditions.

1.4.7 **Water, energy, and health are prioritized sectors to be developed by the GOP.**

1) Water sector. Pakistan's water sector faces severe stress due to rapid population growth, poor water management, and climate change. According to the 2023 Global Water Security Assessment, Pakistan ranks fifth in water insecurity, the 10th in inefficient use, and 11th in flood vulnerability.[7] It relies on the Indus Basin Irrigation System (IBIS) to support its agricultural economy, which dates to the British system.

2) Energy sector. Institutional complexity, regional imbalances, and persistent financial and operational issues have plagued Pakistan's energy sector. Despite rising generation capacity, distribution inefficiencies—such as high losses, poor bill recovery, and aging infrastructure—remain major obstacles. In fiscal year (FY) 2023-24, average transmission and distribution (T&D) losses exceeded 18 percent, reaching as high as 40 percent in some areas. Limited grid investments constrain renewable integration and access in rural areas, making distribution upgrades essential for improved service delivery and sustainable energy transition.

3) Health sector. Pakistan's health sector faces immense strain from rapid population growth, unequal access, and limited funding availability, worsened by the 2022 flooding. The World Health Organization (WHO) estimates that more than half the population lacks basic health care,[8] and Pakistan ranked 164th on the 2023-24 Human Development Index.[9] Health spending was merely one percent of GDP in 2023, far below the WHO's five percent recommendation,[10] leaving 47.5 percent of costs paid out of pocket and burdening households.[11] Only 40 public and private institutions declare themselves as cancer treatment centers in the fifth-most-populous economy in the world, far below the level needed to meet rising demand.[12]

1.5 Addressing Key Development Challenges: Project Contributions

1.5.1 **An international or domestic investment-grade bond rating is a key prerequisite for Pakistan's successful inaugural sovereign Panda Bond issuance.** The first group of Panda Bonds were issued in 2005 (issuers were ADB and the IFC). In 2024 alone, 44 issuers completed 109 Panda Bond issuances, totaling USD27.06 billion (CNY194.8 billion), representing a 26.1 percent year-on-year increase.[13] As of August 3,

[7] United Nations University (UNU) *Global Water Security 2023 Assessment.* 2023.
[8] World Health Organization (WHO). *Pakistan.* 2023.
[9] United Nations Development Programme (UNDP). *UNDP's 2023-2024 Human Development Report points to a global 'gridlock' of increased inequality and political polarization.* March 14, 2024.
[10] T. Mahmood Ali. *Health Expenditure Situation in Pakistan. Pakistan Observer.* Jan. 31, 2025.
[11] Ali. *Health Expenditure Situation in Pakistan. Pakistan Observer.* 2025. Link.
[12] Usman Ayub Awan, Xingyi Guo, Aamer Ali Khattak, Usman Hassan and Suliman Khan. 2024. "Economic crises and cancer care in Pakistan—timely action saves lives." *The Lancet.* Volume 403, February 2024.
[13] China Lianhe Credit Rating Co., Ltd. 2024. Link. [in Chinese]

2025, the cumulative issuance has exceeded USD139 billion (CNY1 trillion).[14] To date, seven sovereign Panda Bonds have been issued: Portugal, Hungary, Korea, Egypt, the Emirate of Sharjah, Poland, and the Philippines. Panda Bonds have recently gained attention as a low-interest financing alternative for developing economies, allowing them to benefit from China's favorable interest rate environment since the pandemic.[15]

1.5.2 While an investment-grade bond credit rating is not a mandatory requirement for Bond approval,[16] to date, all sovereign Panda Bond issuers except the government of Egypt (rated B by S&P at issuance) have been rated investment grade or above, either internationally (BBB- or equivalent by S&P and other international rating agencies) or domestically (AAA by the three main domestic rating agencies in China). Although Egypt's Panda Bond, which was backstopped by a 100 percent indemnity guarantee from AIIB and the African Development Bank (AFDB), did not obtain an official rating, international and domestic rating agencies verbally confirmed the Bond would have been rated at the Guarantors' (AIIB and AFDB) AAA international. For a sub-investment grade issuer to successfully issue a Panda Bond, a guarantee provided by a highly rated and reputable financial institution is crucial to enable the Bond to be rated at an international or domestic investment grade, which is a prerequisite for the Panda Bond market investors to consider the subscription.

1.5.3 **The Partial Debt Guarantee (PDG) plays a catalytic role in mobilizing financing for future sustainable infrastructure investments.** AIIB's proposed PDG enables Pakistan's first issuance of a CNY-denominated bond in China's capital market, supporting the restoration of Pakistan's policy credibility as acknowledged in the most recent report by the IMF.[17] It was further elaborated as a positive sign for Pakistan's reentry into global markets and economic recovery in a meeting between the IMF and AIIB on August 12, 2025. This Project also lays the groundwork for an alternative funding channel to support upcoming public sustainability initiatives beyond the scope of this Project.

[14] China Securities News. 2025. Link. [in Chinese]
[15] Yan Wang and Zheng Zai. The Potential Role of Panda Bonds in Development Finance. Boston University Global Development Policy Center. 2025..
[16] National Association of Financial Market Institutional Investors (NAFMII). *Panda Bond Manuals*. 2024. Link.
[17] IMF. *IMF Staff Country Reports.* May 17, 2025. Link.

2. Rationale

2.1 Project History. The Project was proposed by Pakistan's Ministry of Finance (PMOF) in November 2024 and was included in AIIB's rolling pipeline on March 5, 2025. To date, the Project Team has conducted in-depth due diligence from August 6 to 15, 2025, along with several rounds of virtual due diligence meetings with PMOF, the responsible line ministries, and the implementation agencies of the Subprojects. The team has further consulted key stakeholders of the Panda Bond market and prospective members of the underwriter group to substantiate the Guarantee indemnity and scope acceptable to the market.

2.2 Project Objective. To support Pakistan's development of sustainable and climate-resilient infrastructure in the water, energy and health sectors by mobilizing private capital through the PDG.

2.3 Expected Beneficiaries. The PDG provided for the Bond will support the livelihoods of Pakistan's local population by financing sustainable water, energy and health infrastructure. The Project is expected to directly benefit the public, as Bond proceeds will be used to improve public water, energy and health services. It will also create new employment opportunities through the construction and maintenance operations required under the Subprojects. The PDG will support the Pakistan's efforts to diversify funding sources and restore its policy credibility in the global market.

2.4 Expected Results. The Project's Results Monitoring Framework is added in Annex 1 and includes the following key indicators:

1. Beneficiaries of protection measures from water-related disasters (disaggregated by gender) (number);

2. Greenhouse gas (greenhouse gas emission reductions from the water Subproject;

3. Greenhouse gas emission reductions from the energy Subproject;

4. Distribution losses in the targeted electricity distribution companies (DISCOs) reduced by at least 5 percent;

5. Number of people benefiting from improved health facilities/services per year (disaggregated by gender);

6. Direct private capital mobilized measured by the amount of capital invested by private investors into the guaranteed Bond.

2.5 Strategic Alignment. The Project is aligned with the Green Infrastructure, Technology-enabled Infrastructure, and Private Direct Capital Mobilization thematic priorities of AIIB's Corporate Strategy. It is also aligned with Pakistan's long-term development strategy.

2.5.1 The Project is aligned with AIIB's **thematic priorities** of the Corporate Strategy as follows:

1) Green Infrastructure. The Project is aligned with the Bank's Green Infrastructure thematic priority, as it supports financing for water, energy and health projects in Pakistan that are consistent with the eligibility criteria of the PSFF.

2) Technology-enabled Infrastructure. The Project is aligned with the Bank's Technology-enabled Infrastructure thematic priority, as it supports Pakistan in adopting smart technologies (water discharge monitoring using sensors, smart energy metering) to enhance efficient infrastructure use.

3) Private Capital Mobilization. AIIB will provide a PDG, without which Panda Bond investors could not invest in the Subprojects in the water, energy and health sectors in Pakistan. This will lead to Private Direct Mobilization (PDM) of capital.

2.5.2 The Project is aligned with AIIB's **sector strategies** as follows:

1) Water. The Project will involve installing discharge monitoring devices along IBIS. This primarily aligns with Principle 4 of AIIB's Water Strategy, supporting an AIIB Member in adopting technology to enhance water use efficiency through improved monitoring, data management and analysis. Leveraging technology and data systems is critical to strengthening population resilience, especially for disaster prediction, preparedness, and response. It also aligns with Principle 1 (Promoting Sustainable Infrastructure) and Principle 3 (Mobilizing Private Capital and Efficiencies) of AIIB's Water Strategy.

2) Energy. The Project will support smart metering in energy distribution, which aligns primarily with Principle 3 of AIIB's Energy Sector Strategy, under which AIIB will support Members to realize their energy efficiency potential in their energy networks. The proposed measure related to the strategy is to support utilities to implement energy efficiency measures (smart metering) in existing distribution networks. Smart metering enables more efficient and transparent energy use, empowering consumers and helping reduce technical losses in distribution. The Project also aligns with Principle 1 (Promote Energy Access and Security) as smart metering enables accurate billing, better demand forecasting and grid reliability.

3) Health. The Project will finance equipment for a cancer hospital and contribute to the construction of a medical complex. This aligns with strategic priority 2 of AIIB's Health Strategy, which highlights support for Members in developing infrastructure essential for delivering quality health services, including the construction and upgrading of health facilities. To operate effectively and ensure quality health care delivery, such facilities must be equipped with modern medical devices.

2.5.3 **Alignment with Pakistan's reform and sector strategies.** Pakistan launched a strategy to access China's financial market, a critical step in enhancing liquidity and promoting economic stability. In June 2024, Finance Minister Muhammad Aurangzeb highlighted the Pakistan's potential to harness economic opportunities by entering China's capital markets through its first Panda Bond, following the example of Egypt.[18] In addition, Pakistan has implemented several strategies and supporting policies to promote

[18] *The Express Tribune*. "FinMin Confirms Launch Date for Panda Bond in Pakistan." Sept. 21, 2025.

sustainable economic development, aligning with the UN Sustainable Development Goals (SDGs). The primary focus areas include improving infrastructure, fostering inclusive economic growth, addressing climate change and enhancing access to social services such as water, energy and health. Key Strategies and Policies include:

1) Pakistan's National Water Strategy 2018.[19] This strategy aims to acknowledge Pakistan's emerging water crisis and provide an overall policy framework and guidelines for a comprehensive plan of action. The strategy emphasizes applying new technologies, such as remote sensing and geographic information system (GIS) tools, to enable accurate monitoring of irrigation water delivery.

2) Pakistan's National Electricity Policy 2021.[20] The policy outlines key goals for the power sector and provides strategic direction to ensure inclusive access to affordable, reliable and sustainable energy. It emphasizes improving the performance of national DISCOs, particularly through the adoption of technological innovations aimed at reducing losses and enhancing tariff collection.

3) The National Health Vision (2016-2025).[21] of Pakistan outlines an overarching strategy to improve population health through universal access to affordable, quality and essential health services delivered by a resilient and responsive health system. It underscores the need not only to mobilize financing as a cornerstone of a well-functioning health sector but also to increase investment in noncommunicable diseases such as cancer to meet rising burdens.

4) Public Sector Development Program (PSDP) 2025-2026.[22] The recent PSDP update allocates significant resources to sectors with strong social and economic returns, such as energy, water, transport, agriculture, health and technology. A renewed emphasis was put on climate-sensitive components for mitigation and adaptation, as well as supporting activities.

2.6 Paris Agreement Alignment and Climate Finance. In line with AIIB's methodology for assessing alignment with the mitigation and adaptation goals of the Paris Agreement, the Project is assessed as aligned. The four Subprojects in the water, energy and social sectors that will be supported by the Bond proceeds have been assessed for their mitigation and adaptation alignment, respectively. Details of the assessments are provided in Section 5.E and Annex 7.

2.7 In respect of the joint MDB methodology for tracking climate mitigation and adaptation finance, USD54.41 million of the AIIB-guaranteed Bond proceeds is considered climate finance, including USD15.95 million for climate mitigation and USD38.46 million for climate adaptation. Detailed calculations can be found in Annex 7.

2.8 Value Addition by AIIB. The Project will benefit the GOP in the following ways:

[19] Asian Development Bank (ADB). *National Water Policy*. Government of Pakistan. April 1, 2018. Link.
[20] Government of Pakistan. *National Electricity Policy 2021.* 2021. Link.
[21] Government of Pakistan. *National Health Vision Pakistan 2016-2025.* 2016. Link.
[22] Government of Pakistan. *Public Sector Development Programme 2025-26.* 2025. Link.

1. As per common practice in China's Panda Bond market, the issuance of the underlying Panda Bond by a sub-investment grade issuer would not be successful without a credible guarantor. Thus, this Project is key to supporting the Government of Pakistan in diversifying its funding sources by accessing the international capital market.

2. To support Pakistan in demonstrating its dedication to developing sustainable and climate-resilient infrastructure to international capital-market investors.

3. To improve the development pace of Pakistan and support its government to pave the funding gap of its water, energy, and health infrastructure development.

4. To improve Pakistan residents' access to quality water, energy and health services.

5. Although this Project is AIIB's second sovereign-backed guarantee on a bond issuance, it is the first time in the Panda Bond market that a sub-investment-grade issuer's bond will be backstopped by a multilateral development bank (MDB) PDG with a less than 100 percent indemnity level. The successful issuance of the Bond will enable Panda Bond investors to gain experience and knowledge with this unprecedented PDG-backed issuance structure, in which they will undertake part of the credit risk not covered by the Guarantee.

2.9 Value addition to AIIB. The Project will benefit AIIB in the following ways:

1. It will be AIIB's second PDG to a government-issued bond, which will be supporting the diversification of the Bank's financial services to its Members.

2. Through this Project, the cooperation and partnership between AIIB and the GOP will be strengthened.

3. This Project will be the first time for AIIB to work with ADB on a sovereign-backed guarantee project and is expected to expand the future cooperation between the two institutions.

4. The Project's innovative structure can be replicated and provides a long-term opportunity for AIIB to contribute to the private direct mobilization of capital among its members.

5. Following Egypt's successful Panda Bond issuance, AIIB has continued to receive similar requests from other Members. The Bank's first PDG-backed bond became a replicable instrument that enables AIIB's Members to diversify their fund-raising avenues.

2.10 Lessons Learned. AIIB's first sovereign-backed guarantee on a Panda Bond—the Egyptian Panda Bond Guarantee—provided a Member with another avenue to diversify its external funding sources. The Egyptian Panda Bond Guarantee was AIIB's first sovereign guarantee project, which demonstrated its innovative features by being: (i) the first sub-investment grade issuer to issue a Panda Bond; (ii) the first bond issued in China with an MDB-guaranteed structure; (iii) first time Egypt issued a Panda Bond; (iv) the first African

country to issue a bond in China; (v) the Egyptian government's first sustainability-labeled bond issuance; and (vi) AIIB's first project-level cooperation with AFDB.

2.11 Although Panda Bond regulators informally indicated that a 100 percent indemnity guarantee is no longer required to mitigate payment risk for a Panda Bond being issued by a sub-investment-grade issuer from a regulatory perspective, bondholders still need a high-indemnity-level guarantee. Through a series of market soundings and engagements with key market stakeholders, the Project Team has confirmed that Panda Bond investors still regard a high-indemnity-level guarantee as fundamental to consider subscribing to a Panda Bond issued by a sub-investment-grade issuer.

2.12 The alignment of the reporting requirements after the bond issuance is stringently supervised by the Panda Bond market regulators. The National Association of Financial Market Institutional Investors (NAFMII) established a Post-Issuance Monitoring Department to monitor, supervise and ensure that bond proceeds are strictly ring-fenced for the usage set forth under a green or sustainable bond issuance framework, which the issuer commits to follow. Additional attention from market regulators on the use of proceeds (UOP) supports AIIB's supervision and monitoring of the project implementation and helps ensure that the Results Monitoring Framework's indicators have been effectively achieved. These matters are closely reviewed by the Project Team in finalizing the Project's design and implementation arrangements.

3. Project Description

3.1 Overview. The Guarantee provided by AIIB and ADB will enable the GOP to issue a CNY Sustainable Panda Bond. The Bond proceeds from the offering will be remitted out of China and be exclusively ring-fenced for eligible sustainable and climate-resilient expenditures under the PSFF. The proceeds of the Bond guaranteed by AIIB and ADB will finance one water sector Subproject, two health sector Subprojects, and GOP's counterpart funding contribution for one energy sector Subproject for which ADB also provided loan financing.

3.2 The Panda Bond Issuance. In practice, the proceeds of a Panda Bond are delivered and settled through the book-entry facilities of the Interbank Market Clearing House Co., Ltd. (also known as the Shanghai Clearing House, or SHCH). The GOP has appointed the China International Capital Corporation to be the lead underwriter (the Underwriter) of this issuance, given it is an experienced underwriter of Panda Bond issuances in China. Other joint underwriters include Bank of China, Hongta Securities and Standard Chartered Bank.

3.3 The Transfer and Trading of Bonds in the Secondary Market after the Bond issuance and registration with the SHCH will be executed in accordance with applicable rules and regulations governing trading of bonds in the China Interbank Bond Market (CIBM).

3.4 Use of Proceeds. In this Project, the Bond proceeds will be remitted out of China. The proceeds, net of fees and expenses in connection with the Bond offering, will be ring-fenced to finance sustainable and climate-resilient Subprojects proposed by PMOF. The Subprojects are required to be aligned with the Eligibility Criteria set out in Annex 2 and are with high readiness of development. Among the list of pipelines provided by the PMOF, four Subprojects in the water, energy and health sectors have been selected upon the consensus of PMOF, AIIB and ADB.

3.5 The four Subprojects include: (i) the installation of telemetry systems across the Indus Basin to enhance water allocation and flood response; (ii) the deployment of smart meters in three DISCOs to reduce losses and improve financial sustainability; (iii) the procurement of medical equipment for the National Cancer Hospital in Islamabad; and (iv) the construction of Phase 1a of the Jinnah Medical Complex in Islamabad to address gaps in specialized health services.

3.6 Eligibility Criteria. The underlying Subprojects to be financed with Bond proceeds will be aligned with the PSFF, as well as AIIB's and ADB's mandate, environmental and social (ES) risk management requirements, and procurement policies. In addition, AIIB prefers to support the underlying energy Subproject financed by the GOP and ADB, given the ES standards and procurement policies are aligned with AIIB's. Annex 2 has more information on the underlying Subprojects' eligibility.

3.7 The Subprojects. The pipeline provided by the PMOF was drawn from the PSDP and has been reviewed and shaped in discussion with AIIB and ADB. This pipeline is for indicative purposes as it might further change based on the eligibility criteria defined in the PSFF and in the Bond's prospectus, which will reflect the policies of AIIB and ADB. The use of Bond proceeds will be allocated indicatively to these Subprojects through GOP.

3.8 Components. The PDG will support Pakistan in raising up to USD250 million equivalent in CNY through a privately placed, three-year maturity, sustainability-labeled Panda Bond in the CIBM in 2026. The Bond proceeds will be used in line with the PSFF to finance four Paris Agreement-aligned Subprojects in the water, energy and health sectors that support climate resilience and improve the livelihoods of Pakistan's citizens. Annex 5 briefly describes the individual project components and Subprojects and detailed Subproject summaries.

1) **Component 1: Water sector – Indus Basin Discharge Monitoring Subproject.** The Subproject will install a telemetry system for real-time hydrological monitoring at 26 key locations across four provinces in IBIS.[23] The Subproject will also establish a federal-provincial oversight mechanism using real-time water allocation visualization dashboards at 10 sites. By providing timely and reliable flow data and related management systems, the Subproject will enhance efficient irrigation practices, equitable water allocation, and enhance public safety by supporting early warning and rapid response to flood events along Pakistan's largest and most critical irrigation network. This Subproject aligns with Pakistan's National Water Policy 2018[24] and the Masterplan for Flood Telemetry Network [25] developed for the Federal Flood Commission with ADB support. The Bond proceeds will finance the installation of telemetry systems in 26 locations.

2) **Component 2: Energy sector – Smart Metering for Energy Distribution Subproject.** This Subproject will finance smart grid solutions for three DISCOs, selected by ADB in consultation with the GOP: Lahore Electric Supply Company, Multan Electric Power Company, and Sukkur Electric Power Company. It aims to upgrade energy usage monitoring capabilities of these DISCOs to reduce technical losses, improve collections and enhance overall financial sustainability. The Subproject will supplement the counterpart financing of the ADB-financed project, Pakistan: Power Distribution Strengthening Project, [26] *as* the Bond proceeds will finance the procurement and installation of around 150,000 smart meters.

3) **Component 3: Health sector –** The Bond proceeds will support two health sector Subprojects:

(a) Phase 2 National Cancer Hospital Subproject. The Bond proceeds will finance the procurement of essential medical equipment for a public cancer hospital in Islamabad, including 200 beds and medical equipment. This Subproject will enable the National Cancer Hospital to offer comprehensive oncology services, including radiology, pathology, surgery, chemotherapy, emergency care and research. The hospital aims to expand equitable access to quality cancer diagnosis and treatment in Pakistan, where such services remain largely inaccessible to most of the population. It is expected to serve over 7,000 cancer patients per year at inception, with the number projected to double within two years after the development completion.

[23] The sites are distributed across the following provinces: 15 in Punjab, 7 in Sindh, 3 in Khyber Pakhtunkhwa, and 1 in Baluchistan.
[24] ADB. *National Water Policy*. Government of Pakistan. April 2018. Link.
[25] Water and Power Development Authority. *National Master Plan for Flood Telemetric Network March 2021*. 2021. Link.
[26] ADB. Pakistan: Power Distribution Strengthening Project. Project Page. Link.

(b) Phase 1a Jinnah Medical Complex and Research Center Subproject. The Subproject involves Phase 1a of the construction of a hospital cluster and research centers in Islamabad to deliver high-quality, specialized medical care and foster collaboration with local health care institutions. Upon completion of Phase 1a, the hospital will have a capacity of 300 beds. The facility will offer patient-centered specialized care that is accessible, cost-effective, and responsive to community needs. Islamabad's rapidly growing population remains underserved, with only 0.85 hospital beds per 1,000 people, significantly below regional peers, such as India with 1.6 beds (2021) or Sri Lanka with four beds (2020) per 1,000 people.[27, 28] The Bond proceeds will finance the hospital podium, three bed towers, an administrative block, parking and other support facilities.

3.9 Project Financing Plan

Table 1. Project Financing Plan/Breakdown of the Maximum Guaranteed Amount

Components	Sector	Subproject Name	Panda Bond (USD million)	Max. Guaranteed Amount Distribution (% and USD million)	
				AIIB's Guarantee	ADB's Guarantee
				44%	56%
Component 1	Water	Indus Basin Discharge Monitoring Subproject	76.0	33.3	42.7
Component 2	Energy	Smart Metering for Energy Distribution Subproject	71.0	31.1	39.9
Component 3	Health	Phase 2 National Cancer Hospital	26.9	11.8	15.1
		Phase 1a Jinnah Medical Complex and Research Center	76.1	33.4	42.7
Subtotal of indicative bond principle			**250.0**	**109.6**	**140.4**
+ Indicative cumulative coupon			35.0	15.4	19.6
Total			**285.0[a]**	**125.0**	**160.0**

[a] To cap both Guarantors' guaranteed exposure of up to 95 percent of the outstanding bond principal plus interest.

3.10 Retroactive Financing. The AIIB-guaranteed Bond proceeds will not be used for any retroactive financing and will be applied only to future expenditure needs of the four Subprojects detailed in 3.8.

3.11 Guarantee Fees. The latest prices updated on AIIB's Sovereign-Backed Guarantees in July 2025 applicable to the Project are summarized in Table 2.

Table 2. Sovereign PDG Fee Structure Applicable to the Project

Fee	Rate (%)	Charging Base	One-time/Recurring
Front-end Fee	0.25	Guarantee Amount	One-time
Processing Charge	0.50	Guarantee Amount	One-time
Annual Guarantee Fee	0.50	Financial Exposure under the Guarantee	Recurring (paid upfront)
Standby Fee*	0.25	Undisbursed amount	Recurring

[27] World Bank. *World Bank Database: Hospital Beds (per 1,000 People), 1960-2021*.
[28] Assuming a total population of around 2.36 million.

*The standby fee is applicable, but indicating the amount as "0," since the full bond proceeds will be disbursed to Pakistan upon bond issuance.

3.12 Expected Coupon Range. As per the latest negotiation between PMOF and the potential underwriters, an indicative annual Bond coupon rate of three percent—110bps to 120bps higher than AIIB's own Panda Bond issuance cost—is likely to be accepted by the potential bondholders given the current market conditions. The definitive coupon rate of the Bond will not be determined before its launch. Such premium on AIIB's own Panda Bond issuance cost reflects a combination of the potential bondholders' considerations regarding the investment, which may include: (i) the GOP as a first-time Panda Bond issuer with high stand-alone credit risk; (ii) the uncovered risk exposure from an MDB-issued guarantee; (iii) liquidity premium; and (iv) unfamiliarity with guarantee-backed bond issuance structures.

3.13 China Chengxin International Credit Rating Co., Ltd. (CCXI), one of the three largest domestic credit rating agencies appointed by PMOF as the official Bond rating agency, has indicated that this MDB-guaranteed Panda Bond can be rated domestic investment grade (AAA) with up to 95 percent guarantee indemnity. Based on the Project Team's market analysis of recently issued (from May[29] to end-July 2025) domestic AAA-rated CNY bonds with the same maturity, the bond coupons ranged from 1.46 percent (state-owned large-scale commercial banks) to 3.99 percent (state-owned real estate companies). Among all these bonds, 75 percent had a coupon between two and three percent.[30]

3.14 Legal Documentation. The legal documentation involved for the PDG structure is as follows:

1. Bond documentation. Bond documentation will include the Offering Memorandum of the underlying Bond, specifying its terms and conditions. It will be disclosed to investors as part of the bond issuance. The Bond documentation will be finalized by the Bond launch. The documentation will be reviewed and agreed by AIIB, with no signature required.

2. Indemnity Agreement. An Indemnity Agreement will be signed between AIIB and the GOP, setting out the issuer's obligation to reimburse AIIB—on demand or as AIIB may otherwise direct—for payments under the PDG, as well as all losses, damage, costs and expenses incurred by AIIB relating to or arising from the PDG. The Indemnity Agreement also sets forth the fee payment obligations as well as the Project-specific operational obligations, including the covenant requiring the GOP to use the issuance proceeds exclusively for eligible expenses under eligible Subprojects. The Indemnity Agreement will be signed before the Bond launch. A breach of obligations under the Indemnity Agreement will allow AIIB to suspend or cancel, in whole or in part, Pakistan's rights to make withdrawals under any other loan agreement with AIIB, or under any AIIB loan to a third party guaranteed by Pakistan and may allow AIIB to declare the outstanding principal and interest of any such loan or credit immediately due and payable. A breach by Pakistan under the Indemnity Agreement will not, however, discharge any obligations of AIIB under the Letter of Guarantee to investors. The Indemnity Agreement will be governed by public international law.

[29] When the latest domestic interest cut by the People's Bank of China occurred.
[30] Wind. July 31, 2025.

3. Letter of Guarantee. The Guarantee will be reflected in the form of a Letter of Guarantee, a legally binding document issued jointly by AIIB and ADB for the benefit of bondholders. It will set forth the Guarantee of payment of 95 percent of the Bond principal and interest due on scheduled payment dates, up to each guarantor's pro rata share of the Maximum Guaranteed Amount (up to USD285 million equivalent in CNY). It will be referenced in the Bond documentation and will take effect at the Bond launch. The obligations of the Guarantors under the Letter of Guarantee will remain in full power and effect until their respective obligations are fully paid or the Letter of Guarantee is terminated. The Letter of Guarantee will be governed by the laws of the People's Republic of China, as required by regulators.

4. Co-Guarantor Agreement. AIIB and ADB (the Guarantors) are expected to enter into an agreement setting forth their obligations and arrangements in the areas of (i) information sharing; (ii) the process and procedures for any coordinated actions that may be required under the Guarantee; and (iii) other arrangements between AIIB and ADB as needed.

3.15 Effectiveness of the Guarantee and Conditions for a Guarantee Call. Upon execution of the Indemnity Agreement, Letter of Guarantee, and the Bond documentation, the Guarantee will become effective. The Guarantee will only be called if there is a triggering event, defined by the Letter of Guarantee and Bond documentation. The precise definition of the triggering event for the call on the Guarantee cannot be determined until closer to Bond launch, but it is envisaged to be a certain number of days after the non-payment of interest and/or principal according to the payment schedule.

3.16 Following payment by AIIB of its respective shares, the Bank may, at its sole discretion and as provided in the Indemnity Agreement, demand immediate repayment or set different repayment terms. In approving the repayment terms, management will consider the door-to-door tenor of the PDG transaction, therefore factoring in the tenor of the guarantee when defining the final maturity for repayment (subject to the average maturity limits applicable to sovereign-guaranteed loans). AIIB's Board will be informed of such repayment terms.

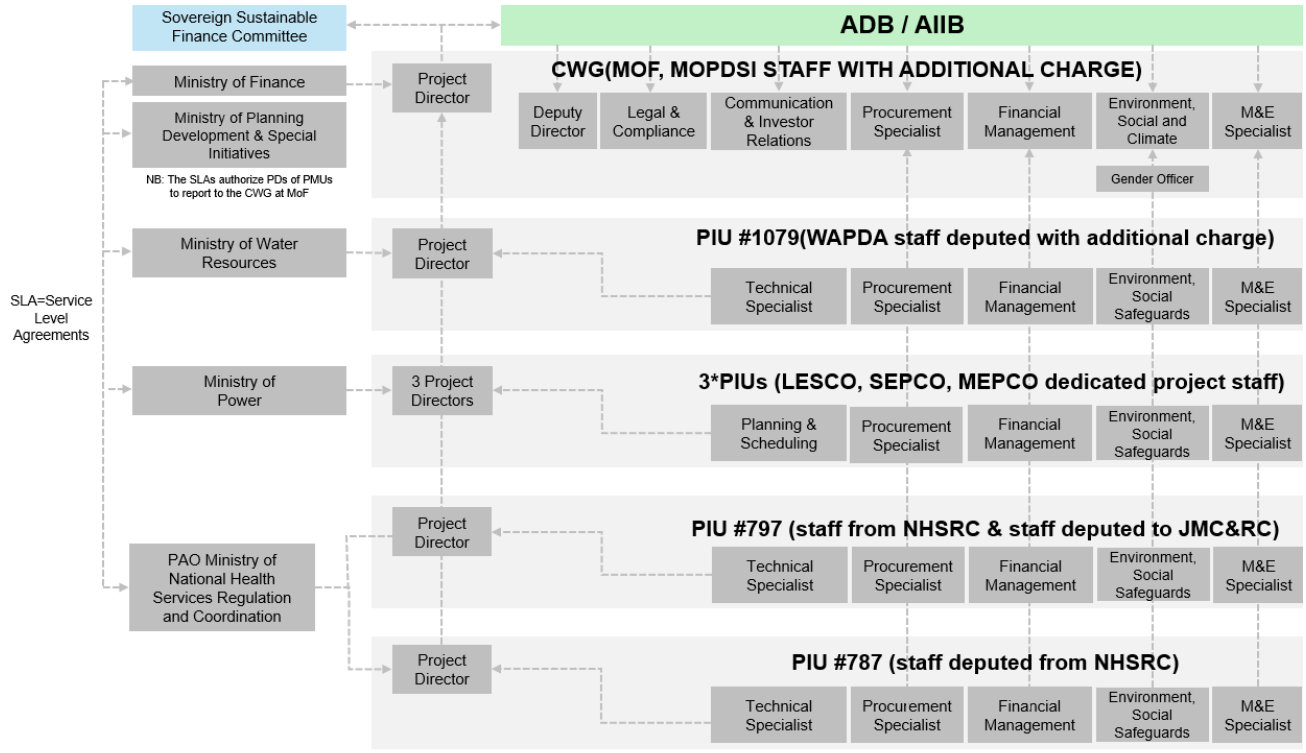
3.17 Implementation Arrangements and Readiness

3.17.1 **Implementation period.** The PDG is expected to be implemented from the Bond issuance date to the Bond maturity date, covering a period of three years. Based on the Project Team's findings during due diligence, all Subprojects are expected to be completed during the implementation period.

3.17.2 **Implementation management.** The PMOF, representing the GOP, has overall responsibility for overseeing international financial institution-financed projects in Pakistan. Within the PMOF, the Debt Management Office (DMO) is tasked with leading the bond issuances and coordinating with relevant line ministries and implementation agencies of the Subprojects. For this Project, a dedicated Central Working Group (CWG) will be established by PMOF, with representatives from the Ministry of Planning, Development & Special Initiatives (MOPDSI). The CWG's main purpose is to (i) serve as a bridge between the implementation level and the top-level steering body (Sovereign Sustainable Finance Committee); (ii) ensure that Subprojects are implemented in line with the development

plan; (iii) monitor fiduciary, environmental and social compliance of Subprojects with the PSFF and the Guarantors' relevant policies and standards; (iv) ensure that Bond proceeds are fully allocated to the Subprojects; and (v) oversee the preparation and submission of relevant internal and public reporting. At the Subproject level are dedicated Project Implementation Units (PIUs) established within Subproject Implementation Agencies (SIAs) that are relevant responsible line ministries or their wholly entities: (i) the Water & Power Development Authority (WAPDA); (ii) the three electricity DISCOs: Lahore Electric Supply Company (LESCO), Multan Electric Power Company (MEPCO) and Sukkur Electric Supply Company (SEPCO); (iii) the Jinnah Medical Complex and Research Center Company (JMCRCC); and (iv) the Ministry of National Health Services, Regulations, and Coordination (MONHSRC). These PIUs will implement the Subprojects with the requisite governance and control measures, as well as regular monitoring and reporting to the CWG. External verification on the allocation of net proceeds to eligible expenditures and impact indicators, as required by the PSFF, will help ensure transparency, enhance accountability and mitigate fiduciary risks while aligning with the climate and development objectives of AIIB and ADB. Figure 1 presents the detailed structure of the Project implementation arrangement. Table 3 summarizes the respective Subproject arrangements.

Figure 1: **Project Implementation Arrangement**



Sovereign Sustainable Finance Committee = Secretary Finance (chair); Secretary MoPDSI (deputy-chair); Director PMU (member secretary); Secretary MoCC & EC; DG Debt MoF; Member Food Security & Climate Change MoPDSI; Chief Water MoPDSI; Chief Power MoPDSI; Chief Health MoPDSI; Director Debt MoF; ; Joint Secretary MoCC; Joint Secretary Budget Wing FD; Joint Secretary EAD; Rep SBP; Rep AGP.

3.17.3 The CWG will be composed of the relevant government officials, with additional charges delegated as and when required by PMOF and MOPDSI and may be augmented by individual consultants if necessary. The Project Director will be designated from DMO and will act as the primary focal point for the transaction. In addition, the CWG will have Project Directors covering procurement, financial management (FM), E&S safeguards, climate finance, legal compliance and investor engagement.

3.17.4 The CWG will coordinate with the PIUs established within the SIAs. The establishment of Service Level Agreements between the principal accounting officer for each ministry and the PMOF will streamline the reporting lines of the PIU Project Directors with the CWG.

Table 3. Summary of Subproject Implementation Agencies

Subproject	Relevant Ministry	Subproject Implementation Agency
Indus Basin Discharge Monitoring	Ministry of Water Resources (MOWR)	Water and Power Development Authority (WAPDA)
Smart Metering for Energy Distribution	Ministry of Energy (MOE)	Lahore Electric Supply Company (LESCO), Multan Electric Power Company (MEPCO), Sukkur Electric Power Company (SEPCO)
Phase 2 National Cancer Hospital	Ministry of National Health Services, Regulations and Coordination (MONHSRC)	Pakistan Institute of Medical Sciences (PIMS)
Phase 1a Jinnah Medical Complex and Research Center	MONHSRC	Jinnah Medical Complex and Research Center Company (JMCRCC)

3.17.5 **AIIB's implementation support.** A Project Operations Manual (POM) will be developed to help streamline and support the GOP in selecting eligible underlying Subprojects and in overseeing the implementation of the Bond's UOP. The Project Team will also conduct supervision missions to monitor the implementation of the UOP. The frequency of these missions will depend on implementation progress and complexity.

3.17.6 **Project Operations Manual**. A POM will detail the implementation processes of this Project and will include a procedure for conducting E&S due diligence if new activities are proposed to replace any of the current activities. The POM will be developed prior to the PDG's effectiveness.

3.17.7 **Reporting and monitoring.** The CWG is responsible for providing, in a timely manner, the reports requested by AIIB on the use of bond proceeds, covering aspects such as the Results Monitoring Framework, E&S information, procurement and FM. Details of the specific reports required for each aspect will be determined during Project due diligence.

3.17.8 **Environmental and social (E&S).** An annual allocation and impact report will be published in accordance with the reporting frequency of the Bond, disclosing amounts allocated to various eligible Subprojects, unallocated amounts, and Subproject-level impact reporting. An independent E&S monitoring report on actions included in the corrective action plan and implementation status of Environmental and Social Management Plan (ESMP) will also be provided, as applicable. Details of the reports are presented in Annex 6.

3.17.9 **Procurement.** The CWG, in coordination with the PIUs, is responsible for supervising and monitoring procurement activities throughout the Project life cycle. A

Project Procurement Implementation Monitoring Report must be submitted to AIIB within six months following the end of each fiscal year. The report should cover the following information:

1) Procurement implementation status, including progress against planned activities

2) Capacity-building initiatives, such as staff training and development to enhance procurement and contract management skills

3) Compliance, highlighting any deviations from applicable procurement policies

4) Contract amendments, including change of scope, contract price and other significant contract variations exceeding 15 percent of the original contract price, along with any delays or quality concerns

5) Contractual issues, including nonperformance, disputes, arbitration proceedings or contract terminations.

3.17.10 Additionally, any instance of procurement-related prohibited practices must be reported to AIIB promptly.

3.17.11 **Financial management (FM)**. The CWG has an FM function that provides overall coordination and oversight for the Project's FM and reporting, identifying expenditures and budget programs that adhere to the eligibility criteria and exclusionary criteria established in the PSFF. The PIUs within Subprojects' lead ministries are responsible for the FM of their respective Subprojects.

3.17.12 The CWG is responsible for monitoring and supervising the allocation of eligible expenditures, with regular financial reports submitted by PIUs in relevant ministries to track the utilization and execution of allocated funds for the eligible Subprojects. The annual allocation report, disclosing the allocation of net proceeds and impact of proceeds, will be made publicly available within one year of the bond issuance. The Project will provide an external verification report annually. This report will assess the allocation of net proceeds towards eligible expenditures and the progress of each Subproject's implementation throughout the three-year issuance period. An external audit of the Panda Bond Project will be conducted annually by the Auditor General of Pakistan (AGP). The external verification report and the audited Project consolidated financial statements shall be submitted to AIIB no later than six months after the end of the fiscal year.

3.17.13 **Flow of funds at Bond issuance and repayment.** At issuance, the Shanghai Clearing House (SHCH) is expected to collect the proceeds raised during the issuance of the Bond. Once successfully issued, SHCH will deposit the net proceeds into an onshore non-resident CNY account (NRA) owned by PMOF's Central Bank (State Bank of Pakistan or SBP). Then, an inter-bank deposit takes place to transfer the proceeds from the SPB's NRA to the CNY offshore account. The SBP subsequently deposits the equivalent amount in Pakistan rupee (PKR) to PMOF's account for future distribution to MOPDSI for disbursement to the Subprojects. This is demonstrated in Figure 2a.

3.17.14 For coupon payments and principal repayments under normal performance, SBP will use its existing CNY balance[31] to transfer funds in CNY to the designated PMOF NRA in China prior to the relevant coupon or principal due date. The funds will then be deposited in the designated SHCH account for the Bond payments and subsequently distributed to bondholders (Figure 2b).

Figure 2a. Funds Flow for Bond Proceeds at Issuance



Figure 2b. Funds Flow for Interest and Principal Payment



3.17.15 **Funds flow of distribution to Subprojects.** All eligible Subprojects that qualify under the PSFF of the Bond issuance must be approved as part of the national budget process. Each year, the Finance Division issues a quarterly release strategy, while MOPDSI authorizes Subproject-level funds based on approved ceilings, implementation progress and funding needs. For the PSFF, budgets for all underlying Subprojects are already approved. Bond proceeds will be allocated to these Subprojects over the three-year tenor of the Panda Bond, in line with the regular annual appropriation cycle. MOPDSI, in coordination with PMOF, oversees allocation and utilization at the Subproject level.

3.17.16 After receiving the deposit of the Bond proceeds from SBP, PMOF will allocate the funds to the PKR account of MOPDSI to finance the expenditures of four eligible Subprojects based on the approved GOP budget, covering the following three budget years (implementation period of the Project) starting from the year of Bond issuance.

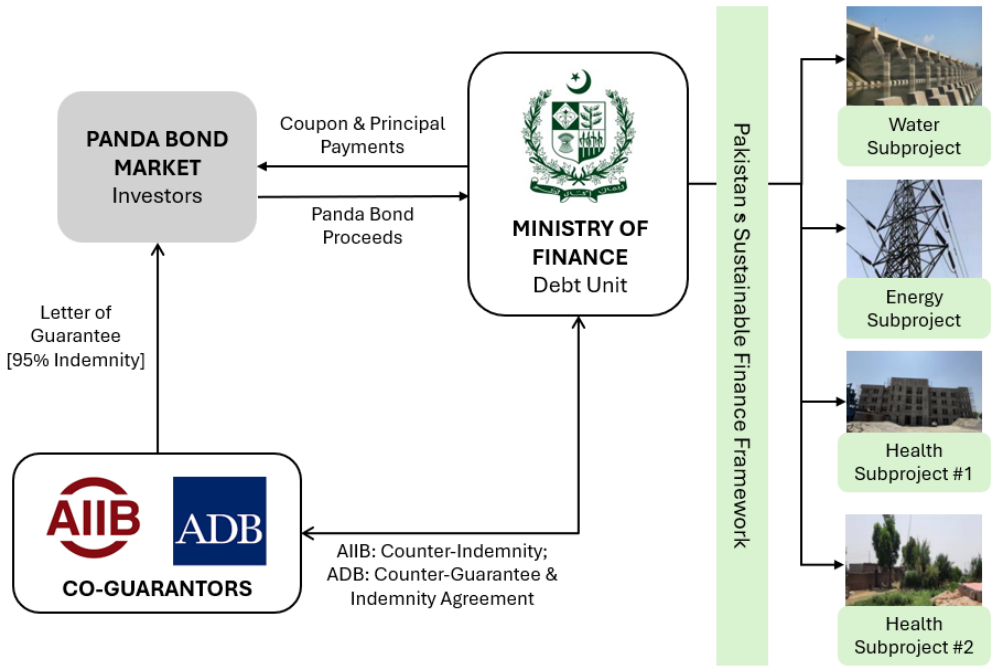
[31] Obtained through different CNY-raising channels.

4. Project Assessment

A. Technical Analysis

4.1 **Project Structure.** This Project will be the first sovereign Panda Bond issued by the GOP and the second Panda Bond issuance backstopped by an MDB-issued Guarantee. The GOP will issue a Bond of up to USD250 million equivalent in CNY with a three-year maturity through a private placement for qualified institutional investors in CIBM. AIIB and ADB will provide a three-year Guarantee covering up to 95 percent of the outstanding Bond principal plus accrued but unpaid interest. Figure 3 summarizes the Project's co-guarantee structure. The Guarantees from international AAA-rated institutions will secure a Chinese domestic investment-grade (AAA) rating for the Bond, enabling lower associated pricing than what the GOP could otherwise access, given the Pakistan's current sovereign rating of B-/Caa1/B- (S&P/Moody's/Fitch) of Pakistan. This Bond will enable the GOP to finance sustainable and climate-resilient expenditures as per the eligibility criteria set forth in Annex 2.

Figure 3. Pakistan Co-Guarantee Panda Bond Structure



4.2 The following technical analysis will focus on (i) technical assessments of the Subprojects, and on (ii) a technical assessment of the Bond that enables the financing of the Subprojects.

(I) Technical Assessments of Subprojects

4.3 **Indus Basin Discharge Monitoring**

1. **Irrigation in Pakistan.** Irrigation in Pakistan's water sector is centered on the Indus Basin Irrigation System (IBIS), recognized as the largest contiguous irrigation network in the world, supplying water to about 90 percent of the irrigated land.[32] Governed

[32] World Bank Group. *Managing Groundwater Resources in Pakistan's Indus Basin*. March 25, 2021. Link.

under the 1991 Water Apportionment Accord (WAA), IBIS is operated through a system of reservoirs, barrages and canals managed by federal and provincial authorities. The Indus River System Authority (IRSA) was established in 1992 to regulate and monitor the distribution of waters of the Indus River System in accordance with the WAA. Overall water sector oversight is led by the MOWR, with implementation support from WAPDA and local government departments. Established in 1958, WAPDA is Pakistan's government-owned public utility responsible for water and hydropower management.

2. Water Scarcity and Monitoring Gaps. Declining water availability has become a serious threat to Pakistan, compounded by climate change, and the absence of modern tools for effective sector oversight. Since 1950, Pakistan's population has increased more than fivefold, while per capita water availability has fallen from about 5,300 cubic meters to less than 900 cubic meters per person per year (2021). This places Pakistan well below the threshold of water scarcity.[33] Within IBIS, water monitoring remains constrained by outdated telemetry, limited groundwater data and weak institutional coordination, hampering efficient allocation and loss reduction. The main challenges for Pakistan's water sector are limited water data availability, rudimentary and non-standardized infrastructure for managing water data and lack of data monitoring capacity are widely recognized as top priority challenge of the country's water sector.[34] Therefore, among the main targets of Pakistan's National Water Policy 2018-2030[35] is "real-time monitoring of river flows by IRSA through *inter alia* telemetric monitoring to maintain a transparent water accounting system."

3. Technical Assessment of the Indus Basin Discharge Monitoring Project. In 2015 consultants of the National Engineering Services Pakistan (NESPAK)[36] completed a comprehensive condition study for Pakistan's telemetry system. Among its key findings, they found that the existing system commissioned in 2004-2005 was no longer operational and had outlived its useful service life. It recommended designing, procuring and commissioning a new system. In 2003, IRSA and WAPDA, under the direction of the GOP, installed the country's first telemetry system on all the rivers of IBIS, covering two dams, 16 barrages/headwork and 48 canals. The telemetry system remained operational for more than a decade. However, owing to various reasons, including non-availability of spare parts and Operations and Maintenance (O&M) funds, and, most importantly, a lack of ownership by stakeholders, the telemetry system became non-functional. The new proposed system under this Subproject will comprise three core segments: (i) Data acquisition: gate position sensors, upstream and downstream water level sensors, and data loggers will collect real-time flow and level data; (ii) Data transmission and storage: data will be transmitted via GSM/mobile networks and/or Very Small Aperture Terminal,[37] with temporary storage at remote sites and permanent archiving on IRSA's central cloud/server; (iii) Data access and

[33] M. Soban. "Population Growth, Low Storage Make Pakistan Vulnerable to Water Crisis." *Independent News Pakistan*. Feb. 17, 2022. Link.
[34] World Bank. *Group. Pakistan's Water Sector Architecture*. 2021. Link.
[35] Government of Pakistan. *National Water Policy*. 2018. Link.
[36] The National Engineering Services Pakistan (NESPAK) is Pakistan's premier state-owned engineering consultancy, offering comprehensive services in water resource development, dams, irrigation, hydropower, transportation, infrastructure, and environment-related projects.
[37] Very Small Aperture Terminal, a satellite communication system that uses small dish antennas (typically 0.75-2.4 meters in diameter) to send and receive data via satellite.

visualization: control rooms will be established at key locations, supplemented by 10 dedicated monitoring sites at the federal-provincial level, enabling continuous access and visualization of telemetry data. Data outputs will be publicly accessible via a website. IRSA, federal, and provincial stakeholders will receive access via a dashboard or mobile phone application. Annex 5 summarizes further technical details of the individual Subprojects.

4. Subproject Readiness: Subproject construction is ongoing, and 30 percent of civil work is completed up to date. An engineering, procurement and construction (EPC) contractor was hired in July 2024, and with 90 percent of systems procured (80 percent already delivered to Pakistan), completion of all works is expected by Q1 2027.

4.4 Smart Metering for Energy Distribution

1. Energy Distribution in Pakistan is primarily undertaken by 12 licensed performance monitoring.[38] Each DISCO is responsible for electricity retail within its defined geographic jurisdiction utilities. Eleven of the DISCOs are state-owned, established under the administrative oversight of the Pakistan Electric Power Company and regulated by the National Electric Power Regulatory Authority (NEPRA), which is also in charge of tariff setting, including metering, billing and tariff collection. In addition, K-Electric, the only privately owned and vertically integrated utility, operates in Karachi and surrounding areas, managing generation, transmission and distribution.

2. Circular Debt, Transmission and Distribution (T&D) Losses. Over the past decade, Pakistan's electricity sector costs have persistently exceeded revenues, posing a significant challenge to its economic sustainability. Power sector debt is largely backed by government guarantees, with uncovered shortfalls adding to overall national debt. As of June 2024, accumulated power sector liabilities (circular debt) stood at PKR2.4 trillion (approximately USD8.5 billion), reflecting a 3.6 percent year-on-year increase and equivalent to about 2.3 percent of GDP. Significant T&D losses, together with weak revenue collection by DISCOs, remain key contributors to the sector's poor financial performance. In FY2023-2024, average T&D losses across all DISCOs were 18.3 percent, compared to 16.8 percent in the previous year and against a 12.15 percent national target.[39, 40]

3. The three DISCOs included the Subproject—LESCO, MEPCO and SEPCO—were selected in consultation with the GOP based on investment needs.[41] Together, they serve 28 districts with approximately 14.1 million customer connections,[42] which translates into a served population of 88.7 million, or 37 percent of the total

[38] See website for more information: Link.
[39] National Electric Power Regulatory Authority (NEPRA). *Performance Evaluation Report: Distribution Companies, 2023-24.* 2024.
[40] The Pakistan Credit Rating Agency (PACRA). *Power.* February 2025. Link.
[41] The subproject is financed in parallel by ADB's Power Distribution Strengthening Project, and the selection of DISCOs was aligned with its project scope. ADB. *Pakistan: Power Distribution Strengthening Project*. Link.
[42] Total connections calculated based on the following sources: Associated Press of Pakistan. *LESCO's Protected Customers Increase by 502,959*. July 6, 2025. Link; Associated Press of Pakistan. *MEPCO Provides 441,133 New Electricity Connections.* July 28, 2025. Link; NEPRA. 2025. Link.

population.[43] MEPCO and LESCO are the largest DISCOs in Pakistan, with 8.3 million and 5 million connections, respectively. SEPCO manages around 0.81 million connections in a service area characterized by low population density and limited infrastructure services. SEPCO also recorded the second-highest T&D loss rate among all DISCOs, at around 34.9 percent in FY2023-2024.[44]

4. Technical Assessment of the Smart Metering for Energy Distribution Subproject. Under the ADB Project, LESCO, MEPCO and SEPCO will install at least 300,000 smart grid solutions - Advanced Metering Infrastructure (AMI) and Asset Performance Monitoring System (APMS) devices - at customer premises and distribution transformers.[45] The Panda bond proceeds will cover approximately 50 percent of the advanced metering devices. AMI enables real-time collection of consumption data, help monitor usage patterns, detect irregularities and respond quickly to outages, thereby improving billing accuracy, revenue collection and the financial sustainability of distribution operations. For consumers, AMI increases transparency and control by providing real-time data to track usage, identify savings opportunities, and ensure accurate billing—reducing disputes and fostering trust between customers and DISCOs. APMS units provide real-time measurement of energy flows and power quality, while protecting transformers from overloads and faults. Finally, continuous data flows support grid optimization and load management, enabling better demand forecasting and distribution planning, which enhances grid stability and minimizes overloads and blackouts. Several national policy plans in Pakistan and strategies have emphasized smart metering to reduce T&D losses. A recent industry report of the National Electric Power Regulatory Authority of Pakistan,[46] for example, recognized the benefits of AMI, noting that authorities have advised DISCOs to transition to AMI metering devices.

5. Subproject Readiness: The bidding process for AMI devices is ongoing. The Subproject involves no construction, as the devices will be distributed by DISCOs. Device production is expected to take three to four months, with installation scheduled from Q2 2026 to Q2 2027.

4.5 Phase 2 National Cancer Hospital

1. Pakistan's health sector. Pakistan's health system is divided between public and private institutions, each accounting for roughly one-half of total health expenditure, with the private sector largely funded through out-of-pocket spending. Government spending on public health services has remained largely below international benchmarks—at only around one percent of GDP (FY2021 to FY2023)[47, 48]—far below the recommended minimum of five percent, and significantly lower than the average for lower-middle-income countries (3.89 percent) or the global average (9.89

[43] Approximate figures calculated using an average household size of 6.3 and a total population figure of 241.49 million, as per the 7th Population and Housing Census in 2023.
[44] Only PESCO recorded a higher T&D loss rate in FY2024 of 38.1 percent. NEPTRA. *Performance Evaluation Report: Distribution Companies, 2023-24.*
[45] Tentatively allocates as follows: 132,000 for LESCO, 150,000 for MEPCO, and 50,000 for SEPCO.
[46] Pakistan Bureau of Statistics. *National Health Accounts 2021-22.* 2022. Link; NEPRA. *State of Industry Report 2023.* 2023. Link.
[47] It was around three percent if household out-of-pocket expenses, nongovernment organization expenses, etc. are included.
[48] PACRA. *Healthcare.* February 2025. Link.

percent).[49] Despite a rapid population increase of 15.6 percent between 2015 and 2024,[50] hospital bed density in Pakistan has remained largely stagnant over the same time (at around 50 to 60 beds per 10,000 population) and is equally below benchmarks.[51] Scarcity is particularly severe for specialized service areas. For example, there are no dedicated public institutions for cancer or mental health, leaving low-income and rural populations effectively excluded unless they can travel abroad or afford private care. The sector is overseen by the MONHSRC, while provinces are responsible for service delivery.

2. Cancer prevalence. Cancer data in Pakistan remains fragmented and inconsistent, primarily due to the absence of a national cancer registry and reliance on hospital-level data, which lacks population-based representativeness.[52] Nevertheless, available estimates indicate a substantial cancer burden, with approximately 185,748 new cancer cases and over 118,631 cancer-related deaths reported in 2022. The leading cancer types are breast, lip and oral cavity, and esophagus.[53] Breast cancer has the highest incidence in Asia, accounting for nearly 12 percent of cancer cases among women, with one in nine women expected to develop the disease.[54]

3. Pakistan Institute of Medical Sciences (PIMS). The Subproject is located at PIMS, a major public sector hospital and medical teaching institution in Islamabad and one of Pakistan's premier tertiary care centers. PIMS's oncology department is currently the only government-sector cancer treatment facility in the Islamabad Capital Territory. Although more than 7,000 patients are treated annually, the department has only eight dedicated beds for cancer patients. This implies that the vast majority are treated as outpatients (e.g., chemotherapy and follow-ups), while those requiring hospitalization face long waiting lists or must seek care at expensive private clinics elsewhere or abroad. At present, there is no dedicated in-house radiology service for oncology patients.

4. Technical assessment of the Phase 2 National Cancer Hospital Subproject. Under the Subproject, MONHSRC will provide equipment for the newly built dedicated cancer hospital at PIMS. The new oncology facility, under construction since mid-2023, will include a basement and four stories, with more than 200,000 square feet of space and a planned capacity of 200 beds. Once operational, it will provide comprehensive cancer treatment services, including radiology, pathology, medical oncology, intensive care, emergency services for cancer patients, as well as genetics and research facilities. The radiology department will be state-of-the-art, equipped with X-ray, ultrasound, computed tomography (CT), positron emission tomography–computed tomography (PET-CT), and magnetic resonance imaging (MRI). It will also feature angiography equipment and image-guided biopsy services to support diagnosis and treatment of various cancers. The facility is also expected to

[49] World Bank Group. *Current Health Expenditure (% of GDP) – Pakistan, Lower Middle Income, World.* World Bank Database. Link.
[50] World Bank Group. *Population, Total – Pakistan*. World Bank Database. Link.
[51] In 2019, the global average was 330 beds per 10,000 population, compared with 140 beds per 100,000 for lower-middle-income countries. World Bank Group. Hospital Beds (Per 1,000 People) – Pakistan, World, Lower Middle Income, 1960-2020. Link.
[52] S.S. Virani, K.S. Ahmed, M. Springer et al. *Cancer Registries in Pakistan: A Scoping Review*. 2025. Link.
[53] International Agency for Research on Cancer. *Pakistan.* Global Cancer Observatory. 2022. Link.
[54] The Nation. *Rising Breast Cancer Crisis in Pakistan*. July 16, 2025. Link.

serve as a national center for cancer awareness and capacity building, offering programs to educate the public on cancer types, early warning signs, and prevention and treatment strategies, as well as training specialized cancer care professionals. According to the technical report, the hospital will accommodate approximately 7,000 cancer patients annually at inception, with capacity expected to rise to more than 16,000 within the first three years after completion of the Project. The hospital's delivery model will be subsidized based on patients' income levels. No land acquisition was required, as PIMS allocated own existing land for the subproject.

5. Subproject readiness. Phase 1, the construction of the new cancer hospital, is 80.5 percent complete. Phase 2, the procurement of medical equipment, is divided into five procurement packages, with Invitations for Bids (IFB) scheduled for December 2025. Contract awards are expected in Q4 2026, and installation is targeted for Q1 2027.

4.6 Phase 1a Jinnah Medical Complex and Research Center

1. Context of the Jinnah Medical Complex and Research Center (JMCRC). The JMCRC was conceived in 2022 to address Pakistan's growing health care gap by developing a large public hospital in Islamabad with a planned capacity of about 1,200 beds. The Project concept and master plan were approved in late 2024.[55] In early 2025, the GOP established a dedicated state-owned entity, the Jinnah Medical Complex and Research Center Company (JMCRCC) Limited, under the MONHSRC. The entity operates under the oversight of the Prime Minister and a ministerial steering committee. Responsibility for the preparation, implementation and eventual operation of the hospital will be transferred to JMCRCC Limited, while the Capital Development Authority (CDA) continues to manage Project development and procurement activities in the interim.[56] Once JMCRCC is fully operational, it will receive full responsibility for project development and procurement.

2. Bond proceeds. Bond proceeds will Finance Phase 1a of the Hospital Cluster, encompassing the main hospital building, three bed towers, administration, parking structures, and associated support facilities. It will allow for an initial operation with a capacity of 300 beds.

3. Technical Assessment of the Phase 1a Jinnah Medical Complex and Research Center Subproject. As one of the Subprojects to be financed by the Bond proceeds, Phase 1a consists of a hospital podium with 300 beds, an administrative block, a grid station, a warehouse with loading docks, underground parking facilities, a service tunnel, external boundary walls, roads and landscaping.

4. Subproject Readiness. Procurement of Phase 1a's EPC contractor is underway, with contract award expected by end-2025. All additional financing for Phase 1a has been secured from public sources, and its implementation is planned

[55] K. Abbasi. "Jinnah Medical Complex Master Plan Ready." *Dawn*. Nov. 8, 2024. Link.
[56] The Capital Development Authority is a statutory body under the administrative oversight of the Cabinet Division, mandated to manage urban planning, development, and municipal functions of the Islamabad Capital Territory.

over 30 months from the contract award, with operations to commence immediately afterwards.[57]

(II) Technical Assessment of the Guarantee

4.7 **Guarantee Structure and Co-guarantee Arrangement.** AIIB and ADB will unconditionally and irrevocably co-guarantee, for the benefit of the bondholders, in accordance with their pro rata shares of the Maximum Guaranteed Amount, up to USD285 million equivalent in CNY.

4.8 The Maximum Guaranteed Amount of the Guarantee is to cover up to 95 percent of the outstanding principal amount of the Bond, plus accrued but unpaid interest. Of this, AIIB's maximum guaranteed amount is up to USD125 million equivalent in CNY while ADB's maximum guaranteed amount is up to USD160 million equivalent in CNY.

4.9 The Guarantors' obligations under the Guarantee will constitute irrevocable, direct, general and unsecured obligations of the Guarantors up to their pro rata shares, ranking *pari passu*.

4.10 Under the Guarantee, each Guarantor will assume joint liability (as defined in the People's Republic of China Civil Code[58]) with the GOP for the payment of the guaranteed amounts under the Bond up to its respective pro rata share of the Maximum Guaranteed Amount. If the Guarantee is called, any amount disbursed by the Guarantors will not be available for new payments under the Guarantee.

4.11 **Guarantee Indemnity Level.** As approved during the Project Concept Review in July 2025, AIIB's PDG will cover the outstanding Bond principal and unpaid Bond interest of up to USD125 million in CNY equivalent, which represents 44 percent of the Maximum Guaranteed Amount. The Maximum Guaranteed Amount is to cover up to 95 percent of the outstanding Bond principal and accrued but unpaid Bond interest. Given Pakistan's sovereign is rated at "B-" by Standard and Poor's (S&P), potential bondholders' interests of investment is built based on an MDB-issued Guarantee with a minimum indemnity level of 95 percent to enhance the payment risk of GOP, a sub-investment grade issuer. The regulatory and market research to justify the Guarantee Indemnity Level was conducted by the Project Team.

4.12 **Waiting Period.** The waiting period for the Guarantors to pay bondholders in the event of a call on the Guarantee is proposed to be 29 business days, in line with the practice of Egypt's Panda Bond Guarantee transaction. The actual waiting period is subject to regulatory approval.

4.13 **Guarantee Accelerability.** In light of AIIB's Operational Policy on Financing, the Bank may agree to accelerate the PDG if the Bond is subject to acceleration. In such case, only AIIB will have the right, at its sole discretion, to accelerate the Guarantee when Bond

[57] Phase 1b comprises staff residences, a mosque, and the hospital boundary wall and entrance. All of these are not immediately required for the commencement of initial hospital operations.

[58] Article 688 of the People's Republic of China's Civil Code that where the parties agree in a suretyship contract that the surety and the debtor shall be jointly and severally liable for the obligation, such a suretyship is a suretyship with joint and several liability. Where a debtor under a suretyship with joint and several liability fails to perform his obligation due or when a circumstance agreed by the parties occurs, the creditor may request the debtor to perform his obligation or request the surety to undertake the suretyship liability within the scope of his suretyship.

acceleration is triggered. The Guarantee should not be subject to acceleration by the guaranteed party (i.e., bondholders).

4.14 **GOP's Previous Offshore Bond Issuances.** As of June 2025, Pakistan's total outstanding sovereign bonds stood at approximately USD6.8 billion, comprising around one fifth in Sukuk bonds and the remainder in Eurobonds.[59] Pakistan issued its first Eurobond in 1994 and has a long history of issuing Euro-denominated bonds. The latest USD2.5 billion Eurobond issuance in July 2025 was priced at 7.375 percent for 10 years, lower than the initial guidance of 7.5 percent, while the 30-year bond fetched 8.875 percent. These results underscore improved confidence in Pakistan's economic reforms and the IMF's backing. Pakistan has also been active in the international Sukuk market—Shariah-compliant sovereign bonds structured in accordance with Islamic finance principles. It issued its first international Sukuk in 2005 and as of July 2022, the outstanding stock was estimated at about USD1 billion. Pakistan has also started using Shariah-compliant financing to advance its international fundraising efforts for sustainability initiatives. In May 2025, the government launched its first domestic Green Sukuk worth PKR30 billion (approximately USD106 million), with a three-year maturity and use of proceeds allocated toward sustainability initiatives.[60]

4.15 Overall, as of end-June 2025, Pakistan had about USD134.9 billion worth of outstanding hard-currency-denominated securities, and a well-established presence in international debt markets. Yields on Pakistan's Eurobond were lower prior to COVID-19, with the 10-year bond issued in April 2021 yielding 7.375 percent.[61] However, as external liquidity conditions turned adverse in 2022, yields for Pakistan's Eurobonds and Sukuks spiked dramatically, reaching over 60 percent in mid-2023. By early 2025, yields had declined to around nine percent, reflecting improved investor sentiment and external account stability.[62,63] Amid the improving macroeconomic conditions, Pakistan is seeking to diversify its sources of external finance, including by engaging multilateral and bilateral partners. An issuance in China's capital market under a guarantee from an official creditor represents an opportunity that can help Pakistan build a track record among international sustainability investors while safeguarding external debt sustainability and presence in debt markets at the same time. According to IMF's report, the Project is expected to support Pakistan's effort to restore its policy credibility.[64]

4.16 At the same time, green investments and the prioritization of climate and sustainability financing have gained significant momentum in Pakistan in recent years, spurred in part by the lasting impact of the 2022 floods, widely recognized as a climate change–induced natural disaster. The issuance of green bond guidelines in 2021,[65] along with adoption of the Green Financing Framework underpinning this Project, further reflect Pakistan's growing commitment to aligning its financial policies with its climate and sustainability goals.

B. Economic and Financial Analysis

4.17 **Economic Benefits.** There is a material economic viability for supporting Pakistan's Panda Bond issuance through a credit enhancement. Such Bond issuance underpins

[59] R. Bhatti. "$1Bn Repayment Made Despite Dearth of Forex." *Business Recorder*. April 14, 2024. Link.
[60] Profit. *Pakistan Launches First Green Sukuk Worth Ps30 Billion to Fund New Energy Project.* June 16, 2025. Link.
[61] Dawn. *Eurobond Transaction.* April 2, 2021. Link.
[62] Government of Pakistan. 2025. Link.
[63] Luxembourg Stock Exchange. *Pakistan (The Islamic Republic of).* 2024. Link.
[64] IMF Country Report No. 25/109. Link.
[65] Economy. *SECP Announces Guidelines for Green Bonds Issuance in Pakistan.* June 18, 2021. Link.

socioeconomic growth, builds climate resilience and provides access to critical services and economic opportunities, while ensuring that infrastructure remains inclusive and sustainable. In Pakistan, sustainable water supply, energy access and health services are particularly important. Beyond securing additional financing for sustainable expenditures, this Project will open an alternative funding channel for the GOP as this is Pakistan's first bond issued in China and in CNY. This will improve the GOP's overall financing abilities in the context of tighter access to funding for emerging economies.

4.18 The four Subprojects financed under the Panda Bond issuance, together with the private capital mobilized through the PDG and Partial Credit Guarantee, are assessed to be economically viable.

1. **Indus Basin Discharge Monitoring Subproject.** IBIS, the world's largest contiguous irrigation system, provides 27 million hectares of irrigated land. The Subproject will install a real-time telemetry system to monitor flows at 26 key sites, improving water allocation, reducing losses, and strengthening transparency in interprovincial distribution. This initiative marks the first step toward transitioning from traditional area-based charges to volumetric pricing of irrigation water. By lowering conveyance losses and ensuring more efficient delivery, the Project will increase water availability for agriculture, boost farm productivity and reduce interprovincial disputes. Based on the Co-Guarantor's (ADB) analysis, the internal economic rate of return (EIRR) is estimated at 18 percent. Sensitivity analysis shows that under an adverse scenario with a 25 percent reduction in water benefits, the EIRR is about 11 percent.

2. **Smart Metering for Energy Distribution Subproject.** The Bond proceeds will support loss reduction and modernization measures across three distribution companies—LESCO, MEPCO and SEPCO—through the installation of AMI and APMS, targeted conductor replacement and grid upgrades. These investments will reduce commercial and technical losses, improve collections, and expand capacity to meet growing demand. By cutting losses and curbing theft, the Project will enhance sector efficiency, improve the reliability of electricity supply, and help reduce Pakistan's circular debt burden. Environmental benefits will also arise from reduced generation requirements due to avoided losses. Based on ADB's analysis, the EIRR is estimated at about 14 percent. Sensitivity analysis shows that under an adverse scenario, with a 20 percent reduction in resource cost savings, the EIRR would be about 11 percent.

3. **Phase 2 National Cancer Hospital Subproject and Phase 1a Jinnah Medical Complex and Research Center Subproject.** Two new facilities, a 200-bed cancer hospital and Phase 1a (300 beds) of the JMCRC—will significantly expand access to tertiary care services in Islamabad. These investments are closely aligned with Pakistan's National Health Vision and Universal Health Coverage strategy. The Subprojects will increase the number of public hospital beds and improve timely access to specialized treatment. The hospitals will also enhance training capacity for health professionals, helping address the national shortage of skilled medical staff. Based on ADB's analysis, the EIRR is estimated at 22 percent. Sensitivity analysis shows that under an adverse scenario with a 25 percent reduction in benefits, the EIRR is about 15 percent.

4.19 **Debt Sustainability.** The Project Team conducted a debt sustainability assessment of Pakistan. The economy is currently recovering from a period of macroeconomic stress driven by structural vulnerabilities, external shocks and past policy missteps. The debt sustainability analysis concludes that Pakistan's debt is sustainable with medium to high risk of debt and sovereign stress. The improvement in FX reserves over the past year, supported by the IMF program and bilateral financial assistance, has helped reduce the risk of near-term default.

4.20 Nevertheless, vulnerabilities remain, including elevated debt burden, substantial gross financing needs, and high exposure of domestic banks to sovereign debt. With limited access to international capital markets, Pakistan remains dependent on official financing. Looking ahead, regaining market access is vital to normalizing the debt situation more durably. This is achievable and depends on restoring confidence in macroeconomic management and advancing structural reforms to support private-sector-led growth. Adherence to prudent macro policies, such as that part of the IMF-supported program, will be critically important

C. Fiduciary and Governance

4.21 **Procurement.** AIIB's "Procurement Policy and Directive on Procurement Instructions for Recipients," July 26, 2024–Section 6, Procurement under Bank Guarantees—apply to the Project. The Procurement Policy requires the recipient (and other beneficiaries of Bank financing), as well as suppliers, contractors, service providers, consultants, concessionaires and their agents (whether declared or not), subcontractors, subconsultants and their personnel under Bank-financed contracts for the Project, to observe the highest standards of transparency, ethics and integrity during the procurement, administration and implementation of Bank-financed contracts.

4.22 **Procurement Activities under the Project.** AIIB-guaranteed Bond proceeds will finance procurement of the following four Subprojects:

1. **Indus Basin Discharge Monitoring.** Implementation of the Subproject is currently in progress. The engagement of the contractor and the award of the contract for the installation of the telemetry system were successfully completed without any reported issues. Furthermore, the SIA confirmed that no complaints or grievances have been received regarding the procurement process.

2. **Smart Metering for Energy Distribution.** The total investment cost of this Subproject is USD271 million, of which USD200 million is financed through an ADB sovereign loan approved on December 10, 2024.[66] The proceeds of the Panda Bond will provide the required counterpart financing of the ADB project. As such, the Subproject will follow the ADB Procurement Policy. Procurement under ADB's sovereign loan to this Subproject will be carried out in accordance with the ADB Procurement Framework.

3. **Phase 2 National Cancer Hospital.** A procurement committee has been created in accordance with the relevant official government notification supported by a sub technical committee. While the formation of both committees provides a structured governance mechanism, most members are professionals in fields other than

[66] ADB. Pakistan: Power Distribution Strengthening Project.

procurement, posing a risk for smooth procurement implementation for the Subproject. Hence, it is proposed that the PIU for this Subproject engage an experienced biomedical engineer to prepare specifications and conduct a market study for the equipment before the procurement process begins. The expert is expected to support the PIU throughout the procurement cycle, for example, from planning to contract closure, including testing and quality checks of the equipment received.

4. **Phase 1a Jinnah Medical Complex and Research Center.** The CDA's Procurement and Contracts wing will be responsible for executing all procurement activities for this Subproject on force account arrangements, until the newly established JMCRCC becomes fully functional. The Procurement and Contract Department is a well-established and fully functional unit within CDA, with more than six decades of experience in public procurement and proven expertise in applying and enforcing the Pakistan Federal Government's Public Procurement Regulatory Authority (PPRA) rules and procedures. In addition, the selection of a consulting firm to prepare bidding documents and oversee procurement activities is under way; this will assist CDA in implementing the Subproject's procurement activities. This additional support is expected to strengthen CDA's procurement capacity and further mitigate procurement-related risks. Currently, the JMCRCC is hiring and finalizing its staffing with expected completion by October 2025. Thereafter, the responsibility for subsequent procurement activities and contract administration under this Subproject will be formally transferred from CDA to JMCRCC. A formal handover and training of company staff in procurement is recommended to ensure continuity, accountability and smooth transition of Subproject activities.

4.23 **Assessment of Applicable Procurement Policy and Requirements Governing Daily Implementation.** The Bond proceeds will be used as a domestic funding source to finance the Subprojects. Procurement under the Smart Metering for Energy Distribution Subproject will follow ADB's Procurement Policy (2017, as amended from time to time) and Procurement Regulations for ADB Borrowers (2017, as amended from time to time). Procurement for the other three Subprojects financed by the Bond proceeds will follow the PPRA procurement system. The PPRA Act of 2002, as amended by the Public Procurement Rules 2004, is broadly aligned with AIIB's core procurement principles. The e-procurement platform developed by PPRA, ePak Acquisition & Disposal System, supports essential procurement functionalities, including uploading and downloading of bidding documents. It offers sufficient transparency in tender submissions and opening and has been, or will be, adopted for procurement under the Subprojects.

4.24 In summary, the procurement procedures of ADB and GOP's PPRA applicable to the project procurement and the respective Subprojects ensure compliance with AIIB's core procurement principles, supporting procurement to be carried out transparently to satisfy AIIB's policy requirements for Bond-guaranteed Subprojects. Nonetheless, the proposed procurement risk mitigation measures provided in the section on risks and mitigants should be implemented to ensure achievement of the Project Objectives.

4.25 **Financial Management (FM).** A comprehensive FM due diligence has been conducted to identify FM risks and associated mitigation measures. CWG has an FM function that provides overall coordination and oversight for the Project's FM and reporting, identifying expenditures and budget programs that adhere to the eligibility and exclusion criteria established in the framework. The Subprojects' lead ministries are responsible for the FM of the Subprojects. The allocation and fund release processes are governed by Pakistan's established systems. The Finance Division of the PMOF communicates the development budget to the MOPDSI, which determines project-level allocations, with final approval by the Annual Plan Coordination Committee and the National Economic Council. Each year, the Finance Division issues a quarterly release strategy distributing expenditures while MOPDSI issues Subproject-specific fund authorization in line with approved ceilings as well as implementation progress and actual funding needs. The budget of each underlying Subproject under the PSFF, including the portion financed from the bond, has already been approved, and the proceeds will be allocated to these Subprojects over the three-year tenor of the bond, following the regular annual and periodic appropriation cycle. MOPDSI, in coordination with PMOF, oversees the allocation of proceeds and budgetary utilization at the Subproject level.

4.26 MOPDSI's monitoring and evaluation wing, together with representatives from PIUs, will conduct quarterly and mid-year review meetings to assess utilization and analyze bottlenecks of each Subproject. Oversight is further ensured through external audit conducted by the AGP.

4.27 **Use of Bond Proceeds.** According to PSFF, the net proceeds of the Bond will be deposited in a general funding account and ring-fenced for allocation to uses of proceeds aligned with the PSFF. The CWG will manage the allocation and tracking of eligible Subprojects equivalent to the net proceeds of the issuance. A Sustainable Financing Register (SFR), required under the PSFF, contains information such as the details of eligible uses of proceeds by Subprojects and the amounts of net proceeds allocated. The PMOF will review the SFR annually.

4.28 **Registration Requirements.** In accordance with the Interim Measures for the Administration of Bonds Issued by Overseas Issuers on the China Interbank Bond Market (the Measures), issuers are required, before offering bonds, to prepare registration documents for submission to NAFMII for acceptance of the registration. These include an offering memorandum or private placement agreement stating the use of proceeds, along with financial and economic data audited for recent fiscal years, among other information. The GOP is also required to comply with the ongoing disclosure obligations for the subsequent life of the Bond pursuant to China's applicable regulatory rules. The GOP will report annually on the allocation and impact of proceeds from the issuance. These reports will be published to the Guarantors, Panda Bond market regulators and the bondholders within a certain time frame, covering details on the allocation of net proceeds, remaining unallocated proceeds, refinancing status, etc.

4.29 **Financial Management Capacity and Audit.** The capacity of the PIUs is assessed to be adequate for managing all FM aspects of the underlying Subprojects. An external audit will be conducted as part of the Subprojects' reporting mechanism.

1. **Indus Basin Discharge Monitoring.** WAPDA is responsible for this Subproject, which focuses on enhancing real-time water discharge monitoring. As an

autonomous statutory body, WAPDA operates under a well-defined hierarchical organizational structure. The FM of the PIU is supported by the General Manager, though the current staffing is inadequate. The PIU therefore plans to strengthen capacity by recruiting additional qualified staff. The Subproject utilizes customized web-based Enterprise Resource Planning (ERP) software for accounting transactions and financial reporting. An internal audit division is fully functional, while the AGP conducts annual external audits. The finance department of WAPDA will oversee the accounting, recording and reporting of the Subproject.

2. Smart Metering for Energy Distribution. This Subproject is also financed by an ADB sovereign loan and involves multiple electricity DISCOs: LESCO, MEPCO and SEPCO. All of them have finance departments responsible for FM. These finance departments follow government accounting rules and regulations and use ERP systems for financial transactions and reporting. The AGP conducts annual external audits.

3. Phase 2 National Cancer Hospital. MONHSRC oversees this Subproject, which focuses on procuring equipment for a new cancer hospital. MONHSRC has a fully functional finance department and follows government FM rules and regulations. The PIU will use International Public Sector Accounting Standards (IPSAS) for recording transactions and reporting. The FM will be responsible for managing the financial aspects of the Subproject, and additional staff will be recruited as needed. The AGP will conduct external annual audits.

4. Phase 1a Jinnah Medical Complex and Research Center. The JMCRCC is newly established and registered with no prior experience dealing with projects funded by MDBs. MONHSRC, acts as the sponsoring agency and liaises with third-party validation consultants to ensure transparency. Subproject execution is led by JMCRCC management and supported by legal and financial advisors, an EPC construction firm, design consultants and supervision engineers. The PIU's FM function will be staffed with qualified accountants to manage FM activities. The PIU will follow IPSAS and use an ERP system for financial transactions and reporting. The internal audit function will be developed and the AGP will conduct external annual audits.

4.30 **Governance and Anticorruption.** AIIB is committed to prevent fraud and corruption in the projects it finances. For this Project, AIIB's Policy on Prohibited Practices (2016) applies. Detailed requirements will be set out in the Indemnity Agreement.

4.31 **Financial Crime and Integrity (FCI) and Counterparty Due Diligence/Know Your Counterparty (CDD/KYC).** Following AIIB's applicable policies and guidelines, CDD/KYC and FCI due diligence were conducted to assess financial crime risks, including money laundering and terrorism financing risks, sanctions risks, and risks arising from integrity concerns when dealing with counterparties and connected parties in the financing. Integrity screenings were performed with no critical findings. The representatives are identified by World-Check One as politically exposed persons due to their public status.

4.32 **Cybersecurity.** The infrastructure financed is not considered critical infrastructure.

D. Environmental and Social

4.33 **Environmental and Social Policy and Categorization.** AIIB's Environmental and Social Policy (ESP), including the Environment and Social Standards (ESSs) and the Environmental and Social Exclusion List (ESEL), will apply to this Project. ESS 1 (Environmental and Social Assessment and Management) and ESS 2 (Involuntary Resettlement) are applicable to this Project. ESS 3 (Indigenous Peoples) will not be triggered, as there are no identified Indigenous People groups affected or present in the areas of the selected Subprojects. Category B is assigned to the Project as the Subprojects will have a limited number of potentially adverse E&S impacts during the construction and operation phases. None of the Subprojects fall under AIIB's ESEL.

4.34 **Environmental and Social (E&S) Instruments.** The Subprojects considered under this Project include one water sector Subproject, one energy sector Subproject, and two health sector Subprojects. The Bond has a three-year maturity, the Guarantors and PMOF have agreed to support Subprojects that were prepared either according to MDBs' E&S standards, or low- to moderate-risk Subprojects implemented by experienced entities.

4.35 The water sector Subproject includes the installation of a telemetry system for real-time discharge monitoring at 26 key locations across IBIS. It also involves the construction of security rooms, control rooms, and dormitories. WAPDA is executing this Subproject. Civil works on this Subproject have started, and construction progress at the time of due diligence was 30 percent. An E&S audit with corrective action plan as needed has been prepared for this Subproject; corrective actions will be implemented at the Project sites.

4.36 Bond proceeds will be used for two Subprojects in the health sector. One Subproject is the procurement of equipment for a new cancer hospital. The draft environmental and social impact assessment (ESIA) for the hospital equipment component and allied facilities has been prepared.

4.37 The other health sector Subproject is Phase 1a of the development of the JMCRC to reach an initial operational capacity of 300 beds. This Subproject is in its initial stage. The government has identified land for the hospital and prepared the conceptual design. Supervision consultants are expected to be mobilized by September 2025, while the EPC contractor will be mobilized by December 2025. Detailed engineering design and E&S studies will be part of the EPC contract. Based on its conceptual design, the Subproject company has prepared a preliminary ESIA report. This report will be updated based on the detailed design by the EPC contractor and will be shared with the Bank for review and approval. In addition, the detailed design for the hospital construction has not yet been finalized and the exact scope of potential impacts on involuntary resettlement, and livelihoods, is still unknown. A Resettlement Framework is being prepared to guide the process. Once the impacts are confirmed, a site-specific Resettlement Action Plan (RAP) will be developed as needed before commencement of works.

4.38 The energy sector Subproject includes the purchase of advanced metering infrastructure devices for three DISCOs—LESCO, MEPCO and SEPCO—selected by ADB in consultation with the MOE. E&S instruments were prepared in line with ADB's Safeguard Policy Statement (SPS). These instruments were found to align with AIIB's ESP and will be implemented by the Subproject entities. As the Subproject instruments were prepared under ADB's SPS and AIIB's

ESP also applies to the Project, it was agreed that compliance with the AIIB's ESP will be explicitly reflected in the Indemnity Agreement.

4.39 **PSFF.** The PSFF is an important step in aligning the national financing strategy with Pakistan's sustainability commitments.

1. **Use of proceeds.** The use of proceeds will be allocated to green, blue, social and sustainability financing instruments. The eligible sectors include (i) green and blue: renewable energy, energy efficiency, pollution prevention and control, environmentally sustainable management of living natural resources and land use, terrestrial and aquatic biodiversity management, clean transportation, sustainable water and wastewater management, climate change adaptation, and green buildings; and (ii) social: affordable basic infrastructure, access to essential services, affordable housing, employment generation, food security and sustainable food systems, and socioeconomic advancement and empowerment.

2. **Process for Project evaluation and selection (covers identification and mitigation of E&S risks):** The GOP has established a Sovereign Sustainable Finance Committee (CFSS), chaired by the secretary of PMOF, with members including representatives from the DMO, the PMOF's budget wing, the MOPDSI, the Ministry of Climate Change and Environmental Coordination (MOCC&EC), the Economic Affairs Division, and the SBP. The CFSS will identify expenditure and budget programs, develop processes to manage the E&S risks associated with Projects, monitor the implementation of the framework, and prepare allocation and impact reports.

3. **Management of proceeds.** The PMOF will manage the allocation of an amount equivalent to the net proceeds of its Sustainable Financing Instruments using a bond-by-bond approach. To manage this process, the GOP will establish a virtual SFR, which will be reviewed annually by the PMOF. If any allocated eligible expenditures are removed from the SFR, the GOP will strive to substitute those Subprojects with replacement eligible expenditures.

4. **Reporting.** An allocation and impact report(s) annually to the Panda Bond market regulators, the Guarantors and the bondholders, with transparent disclosure on the allocation of net proceeds to eligible green or social expenditures, as well as on the results and positive environmental or social impact(s) of those expenditures.

4.40 **Environmental and Social Aspects**

1. Water sector Subproject. Anticipated environmental impacts primarily relate to construction activities, including air emissions from machinery, dust generation due to excavation and vehicle movement, soil and water contamination from worksite pollutants, and discharge of domestic sewage, as well as wastewater from temporary facilities. Additional concerns include limited removal of natural vegetation and trees, production of liquid and solid waste (both hazardous and nonhazardous), as well as noise, vibration, health and safety issues. As work will occur within existing environments, minimal to low impact on biodiversity is expected. While the telemetry system will be installed on or adjacent to water bodies, no direct adverse effects are anticipated. Operational phase impacts may include the generation of liquid and solid waste, material spillage, and noise

from routine maintenance activities. These impacts are generally site-specific and reversible, with established mitigation measures available. Contractors have developed and are implementing site-specific environmental and health and safety management plans. Social risks and impacts are limited and relate to labor and working conditions, as well as potential security arrangements. An E&S audit has been conducted for this Subproject to address E&S risks and impacts. The audit identified areas for improvement at certain sites, including the absence of site-specific E&S management plans, lack of designated environmental personnel, missing incident and accident report formats, inadequate solid waste and housekeeping practices, tree clearing without a tree plantation plan, insufficient safety signage, inconsistent use of personal protective equipment, and no grievance redressal mechanism. Site-specific corrective action plans have been prepared and are scheduled for implementation.

2. Health sector Subprojects

(1) The procurement, installation, and operation of medical equipment, as well as minor construction and finishing work on the relevant floors, are expected to result in environmental impacts such as noise and vibrations from power tools and machinery; generation of liquid and solid waste; leftover materials from interior construction, including scrap metal, wood, tiles, plaster, paint containers, and packaging waste; as well as health and safety risks related to potential radiation exposure during operation. The hospital building has been constructed to accommodate this equipment. Social risks and impacts are minor and related to labor and working conditions, labor influx, potential gender-based violence and inadequate stakeholder engagement. A draft ESIA with an ESMP has been developed to address impacts associated with installation, operation, and health care waste management. These impacts are site-specific, reversible, and can be managed with appropriate mitigation measures.

(2) Phase 1a of the Jinnah Medical Complex and Research Center Subproject has been designated as Category B due to the scope and nature of the planned activities. During the construction phase of the Subproject, anticipated environmental impacts include emissions from machinery, dust generation, increased traffic, noise and vibration, potential soil and water contamination, removal of natural vegetation and trees, health and safety risks and the production of liquid and solid waste. In the operational phase, effective management of healthcare waste and ensuring worker safety will be primary concerns. These impacts are expected to be site-specific and reversible, with established mitigation measures available. Potential social risks and impacts include small scale involuntary resettlement and livelihood disruption during the implementation of Phase 1a of the Jinnah Medical Complex and Research Center Subproject. Involuntary resettlement and livelihood impacts will be addressed through a site-specific RAP with fair compensation and livelihood support. Other social risks and impacts are moderate and related to labor and working conditions, labor influx and community health and safety, including potential risk of gender-based violence. A preliminary ESIA has been completed based on the Subproject's conceptual design. The final ESIA will be prepared based on the detailed design and will be submitted to AIIB following the detailed design phase, which is projected to occur before the execution of the Project agreement with PMOF.

3. Energy sector Subproject. The environmental impacts associated with the installation of smart metering devices are expected to be minor due to the scale of the interventions. Social risks and impacts are limited and related to labor influx, labor and working conditions, and community health and safety, including potential risk of gender-based violence. The mitigation measures outlined in the E&S instruments, prepared in accordance with ADB's SPS, will be implemented by the responsible agencies.

4.41 **Gender Aspects**. In Pakistan, structural and cultural barriers continue to restrict women's participation, access to services, and economic opportunities. Overall, the activities will generate benefits and opportunities for women and men, such as job creation and enhanced productivity through improved services. In particular, the health Subprojects have high gender relevance. For example, given the high prevalence of breast cancer in Pakistan, the Phase 2 National Cancer Hospital Subproject is especially important for women. Accordingly, it will include monitoring indicators such as the share of women in the medical workforce and gender-disaggregated data on the population benefiting from the improved facilities. Risks related to Gender Based Violence (GBV) will be mitigated through implementation of the Code of Conduct, including GBV provisions for contracted workers, and related training to be developed by the respective PIUs and incorporated into each relevant Subproject E&S plans.

4.42 **Occupational Health and Safety, Labor, and Employment Conditions.** Potential risks of labor and working conditions include inadequate occupational health and safety measures and potential exclusion of local workers from job opportunities. Mitigation measures will include ensuring compliance with national labor laws and ESS2, establishing accessible worker Grievance Redress Mechanism (GRM), and monitoring contractors and subcontractors for adherence to labor requirements. Special emphasis has been placed on ensuring equal opportunity and nondiscrimination in recruitment, with priority consideration for local workers, including women.

4.43 **Stakeholder Engagement, Consultation and Information Disclosure.** Subprojects' E&S instruments such as ESIA and ESMP will be required to be disclosed on PMOF's and AIIB's websites after the Bond issuance. Consultations with stakeholders are ongoing, and the findings will be reflected in the respective E&S instruments before Project approval. The Project will continue to engage all stakeholders through meaningful consultations, with particular emphasis on including women and other vulnerable or disadvantaged groups.

4.44 This Project Document involves material non-public information regarding private securities issuance. Given the nature of the transaction, the public disclosure by AIIB of its intention to provide guarantee to PMOF through the publication of Project summary information (PSI), Project Document and associated E&S materials may constitute material non-public information regarding a private securities issuance. In accordance with Paragraph 68 of AIIB ESP on Deferral of Disclosure, AIIB has been requested to withhold disclosure until the bond issuance is complete. This was discussed and agreed during the Concept stage IC meeting.

4.45 **Project Grievance Redress Mechanisms (GRMs).** GRMs will be established at two levels to ensure accessibility and accountability. Each Subproject will have its own GRM, managed by its respective PIU, to address site-specific concerns from workers and affected

communities in a timely manner. In parallel, a Project-level GRM will be set up within the CWG to provide oversight, handle grievances that cannot be resolved at the Subproject level and ensure consistency across all sites. Information about the GRMs will be disseminated online and in person.

4.46 **Bank's Project-Affected People's Mechanism (PPM).** AIIB's PPM policy applies to this Project. The PPM has been established by AIIB to provide an opportunity for independent and impartial review of submissions from Project-affected people who believe they have been, or are likely to be, adversely affected by AIIB's failure to implement the ESP, in cases where their concerns cannot be addressed satisfactorily through the Project-level GRM or AIIB Management processes. Information on AIIB's PPM is available at: https://www.aiib.org/en/about-aiib/who-we-are/project-affected-peoples-mechanism/how-we-assist-you/index.html.

4.47 **Monitoring and Supervision Arrangements.** The CWG will ensure compliance with the Bank's E&S requirements. At the Subproject level, dedicated PIUs have been established within the Subproject implementing entities for overall monitoring and reporting. Dedicated E&S staff are part of these PIUs.

4.48 An annual allocation and impact report will be published in accordance with the reporting frequency of the Bond, disclosing amounts allocated to various eligible Subprojects, unallocated amounts, and Subproject-level impact. An independent E&S monitoring report on actions included in the corrective action plan and implementation status of ESIA/ESMP will also be provided on a semiannually basis. AIIB may conduct missions and field visits to assess the project's performance in implementing E&S instruments. The frequency of these missions and visits will be determined as required.

E. Climate Change Risks and Opportunities.

4.49 Climate risk assessments were conducted for each Subproject in accordance with the AIIB Paris Alignment methodology for Direct Investment Operations. For the Indus Basin Discharge Monitoring Subproject and Phase 2 National Cancer Hospital Subproject, physical climate risks were assessed as limited, requiring no further assessment. A medium-level climate risk rating was identified for the Phase 1a Jinnah Medical Complex and Research Center Subproject. Therefore, this Subproject underwent a detailed climate risk and adaptation assessment (CRA) as per the joint MDB methodology. Additionally, a detailed CRA for the Smart Metering for Energy Distribution Subproject was carried out as part of the ADB-approved Power Distribution Strengthening Project in Pakistan. Key findings of the CRAs for the latter two Subprojects are summarized as follows, with full details available in Annex 7.

4.50 **Smart Metering for Energy Distribution Subproject**. The CRA leveraged available climate databases and tools, including the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5), Climate Change Knowledge Portal67, Climate Risk Country Profile for Pakistan68, Global Change Impact Studies Centre under the Ministry of Climate Change of Pakistan, and various other literature. Climate projections were primarily based on the Coupled Model Intercomparison Project Phase Six (CMIP6) ensemble, under

[67] World Bank Group. Climate Change Knowledge Portal Website. Link.
[68] *ADB. Climate Risk Country Profile: Pakistan.* 2021. Link.

Representative Concentration Pathway (RCP) 2.6 (low emissions) and RCP 8.5 (high emissions) scenarios for the mid-21st century (2046-2065). Key climate hazards identified include floods, droughts, heatwaves, rainfall-induced landslides, and wildfires. Adaptation measures to address these risks are as follows:

1. **Improving infrastructure design.** Using enhanced cooling systems, temperature-resilient conducting materials, and improved cables to reduce damage from high temperatures and floods, thereby strengthening resilience to climate change; increasing the plinth height of substations above recorded maximum flood levels; constructing retention walls to mitigate landslide impacts; improving drainage and conducting slope assessments to minimize flood damage; optimizing transmission tower spacing to reduce transmission losses and sagging; and building additional transmission circuits to reroute power during faults.

2. **Adopting modern tools for informed adaptation actions will help expand** the hydrometeorological monitoring network and establish additional weather stations to enhance early warning and climate risk monitoring.

3. **Enhancing DISCO capacity by establishing and training** emergency response teams to protect infrastructure from events such as fires or floods, develop specialized teams for hydrological modeling, disaster monitoring, and forecast to strengthen risk management.

4.51 **Phase 1a Jinnah Medical Complex and Research Center.** Using regional and global data sets, the CRA identified five key climate hazards: heatwaves, floods, wildfires, drought and water scarcity, and rainfall-induced landslides. Climate projections for precipitation, temperature, and dry spells were drawn from CMIP6 climate models for 2040–2059 under both moderate-emission (Shared Socioeconomic Pathway [SSP] 2-4.5) and high-emission (SSP5-8.5) scenarios. The following adaptation measures were identified to be considered in the subproject design to enhance resilience:

1. **Improving infrastructure design.** Conduct slope and drainage assessments; enhance stormwater management; use reflective roofing, insulation, and natural ventilation to mitigate heat stress; develop green roofs and permeable pavements, install solar panels or hybrid generators, and elevate critical equipment with retaining walls.

2. **Adopting technological tools.** Deploy heat- and humidity-resilient information and communications technology (ICT) components; integrate extreme weather alerts into hospital protocols; establish digital health platforms for service continuity; and install smart lighting, heating, ventilation, and air conditioning (HVAC), and energy-efficient medical equipment.

3. **Building capacity.** Train staff in emergency response, conduct disaster preparedness drills, provide shaded areas and property, plant and equipment (PPE) for outdoor workers, equip staff rooms with cooling systems, maintain critical backup power inventories, and deliver health and safety training for extreme heat events.

4. **Strengthening governance and financing.** Institutionalize periodic vulnerability assessments, integrate climate resilience into procurement and facility management,

allocate dedicated funds for adaptation and emergency upgrades, and ensure alignment with national and provincial climate adaptation policies.

4.52 The Subprojects are assessed as consistent with Pakistan's national and sectoral adaptation priorities and strategies, including its Nationally Determined Contributions (NDC) and National Adaptation Plan. The Project is thus aligned with adaptation goals.

F. Operational Policy on International Relations

4.53 **Operational Policy on International Relations**. The water sector Subproject to be financed by the Panda Bond proceeds includes the installation of a telemetry network for real-time flow measurement at 26 key locations across IBIS. The locations are headworks and barrages situated on the Ravi, Chenab, Jhelum, and Indus rivers, which are classified as international waterways in accordance with AIIB's Operational Policy on International Relations (OPIR). The intervention does not involve altering river channels, constructing new structures within the waterways, or undertaking any activities that would directly impact the physical condition of rivers. As only the installation of monitoring equipment is envisaged, no adverse effects on water quality or quantity of the rivers are expected. The primary objective of this intervention is to support the government in collecting accurate river flow data. Enhanced data availability will facilitate effective management and planning of water resources, which is beneficial for both local and regional stakeholders.

4.54 The rivers listed in Section 4.52 are international waterways and the OPIR therefore is triggered. However, given the nature and scope of the interventions, no impact on the riparian states is expected. As a result, the exception to the notification requirement under Section 3.3(c)(i) applies as the Bank expects that the Project will have no effect on other riparian states.

G. Risks and Mitigants

4.55 Based on the assessment, discussions with the PMOF, and other key stakeholders, and review of available documents and information, the Project Team has assigned an overall "medium" risk rating to the Project (Table 4).

Table 4: Summary of Risks and Mitigating Measures

Risk Description	Assessment Ratings (High, Medium, Low)	Mitigation Measures
Macroeconomic Risk External liquidity stress continues, leading to pressure on the currency and persistent inflation, impacting the general macroeconomic stability.	**Medium**	- An IMF program is currently in place to support macroeconomic stability, creating opportunities to secure additional official financing, if necessary. - Macroeconomic conditions have improved, with ongoing fiscal consolidation, inflation falling to historic lows, and external buffers strengthening. This has contributed to upgrading sovereign credit ratings and narrowing credit spreads. - The GOP has good relations with IFIs, and bilateral financial institutions, which enhances its ability to secure external support and mitigate refinancing pressure.

Refinancing Risk Given that the Bond has a bullet structure with a three-year maturity, full repayment of the Bond principal is expected in 2029.	**Medium**	At Bond maturity, the GOP can repay through refinancing or fiscal budget, where the refinancing risk can be mitigated through the points described below: - The GOP has committed to diversifying its funding sources to unlock future opportunities in the capital market. With this potential, the government can refinance by tapping the Chinese capital market or other accessible capital markets at the time. - A consortium of Chinese domestic banks has provided the GOP with a credit line to supplement the liquidity of the State Bank of Pakistan (SBP). - Pakistan is active in the CNY trading market and the SBP also holds assets in CNY-denominated securities to maintain an active CNY book. The SBP indicated that its daily capacity to generate CNY can be as much as up to CNY1 billion. - A USD4.16 billion (CNY30 billion) bilateral FX swap line between China and Pakistan is currently fully used by the SBP. The release of the headroom of the swap line during the Bond maturity is possible and can also be a supplemental source of CNY to mitigate the Bond coupon and principal repayment risk. - The GOP shall maintain throughout the Project's implementation appropriate measures, such as the extension of the current access to a swap line with the People's Bank of China (PBOC), to ensure CNY convertibility.
Technical Risk Low quality of the Subprojects' design	**Low**	- The Project Team has completed a detailed due diligence of all Subprojects, involving technical experts from all relevant sectors (water, energy, and health), E&S, procurement, FM, among others. - Post-issuance monitoring will be conducted on every Subproject to ensure the highest quality of design and construction.
Implementation Risk The Project will be a first of its kind for both the GOP and Chinese regulators, leaving room for unforeseen investor reaction. The Subprojects will be implemented by different implementing entities, which may lead to inconsistencies in the implementation of IFI requirements.	**Medium**	The implementation risk is expected to be mitigated by: - The PMOF has demonstrated strong commitment to the Project, given its strategic importance to Pakistan. As the Bond will be issued under the PSFF, significant resources have been dedicated to ensuring proper implementation and satisfactory monitoring of the Subprojects. - AIIB and ADB involvement and disclosures will help investors access adequate information to successfully issue the Bond and mobilize private capital. - During the on-site due diligence, the Project Team found that all Subprojects are in an advanced stage. Bond proceeds allocation will likely commence within six months of the Bond issuance. - All selected Subprojects will have a construction period of less than 30 months, which can enable

		the development of the Subprojects to be completed within the Bond maturity. - A CWG to monitor implementation of the Subprojects will be established by PMOF, MOPDSI, and other government authorities with substantial experience working with MDBs and strong connections to the implementation agencies of the Subprojects. - The PIUs of the Subprojects have extensive experience working with MDBs on projects or technical assistance programs. - The energy Subproject has secured financing from ADB. Technical assistance and implementation knowledge is specifically provided to the Subproject to streamline the implementation process.
<u>Operational and Maintenance Risk</u> After the completion of the Subprojects, there may be a risk related to the willingness of the PIUs to enter long-term contracts with counterparties for operational and maintenance work.		- The water sector Subproject will be developed by WAPDA and will be transferred to IRSA two years after completion (warranty period). IRSA has substantial experience in operating water flow monitoring projects in Pakistan. - The three DISCOs are the implementation agencies and operating units of the energy sector Subproject. Given that the Subproject is part of the ADB-financed power transmission project, ADB will pay close attention to its operation. - The implementation agencies and operating units of the two health sector Subprojects are the Pakistan Institute of Medical Sciences (PIMS), which currently operates multiple medical research hospitals in Pakistan, and JMCRCC, which is newly established but staffed with experienced experts for project development and operation.
<u>Environment and Social Risk</u> The client's capacity to prepare and implement E&S instruments during the short maturity of the Bond.	**Medium**	- AIIB will only support Category B and C Subprojects that are prepared and implemented according to standard MDB E&S standards. - Draft E&S instruments have been developed and will be finalized before Bond issuance. - AIIB will provide guidance and support as needed during the implementation to ensure effective implementation of all E&S instruments.
<u>Financial Management Risk</u> Major deficiencies in internal controls and noncompliance with core rules and regulations. AIIB guaranteed payments have not been used for eligible purposes.	**Medium**	- The Bank will conduct periodic fiduciary due diligence of the FM arrangements for the Project. Robust internal systems for reporting and monitoring are critical to its success. - FM will assess Project reporting on the financial status and use of funds, together with the implementation progress of each Subproject, to ensure the reasonable allocation of all bond proceeds.
<u>Procurement Risk</u> There is limited procurement and contract management capacity, particularly in two key	**Medium**	- Capacity Building Program: Conduct targeted training for procurement and contract management personnel, especially at Phase 1a of Jinnah Medical Complex and Phase 2 of Cancer Hospital Subprojects.

areas: (i) The newly established JMCRC, where the selection of management staff is still in progress; and (ii) The procurement of specialized equipment for the new Cancer Hospital. Effective coordination remains a challenge among the multiple stakeholders engaged across the four Subprojects, with potential impacts on timely decision-making, implementation, and consolidated reporting.		- For the JMCRC Subproject and the new Cancer Hospital Subproject: Engage procurement experts to manage existing capacity constraints and prepare procurement manuals to ensure consistency and compliance in project procurement implementation. - In general: Engage dedicated and experienced procurement experts in the PIUs to support and coordinate the four Subprojects and provide expert advice as and when required. For example, support from an experienced biomedical engineer will help reduce procurement risks for the cancer hospital's equipment
<u>FX Risk</u> Given the significant depreciation of the PKR in recent years, there is a risk of further currency deterioration. This may lead to difficulties for the GOP to repay the Bond in CNY.	**Low**	- The GOP has multiple channels to generate CNY effectively. - The current CNY-PKR swap line between China and Pakistan will be renewed in 2027. - SBP has available CNY reserves that are currently sufficient to service the debt.

Annex 1: Results Monitoring Framework

Project Objective (PO)	To support Pakistan's development of sustainable and climate resilient infrastructures in the sectors of water, energy, and health by mobilizing private capital through a Partial Debt Guarantee (PDG).							
Indicator Name	**Unit of measure**	**Base line**	**Cumulative Target Values**			**End Target**	**Data source / Methodology**	**Responsibility**
			YR1	**YR2**	**YR3**			
Project Objective Indicators								
Direct private capital mobilized measured by the amount of capital invested by private investors into the guaranteed Bond	USD million	0	125	125	125	125	AIIB	AIIB
Component 1 Water Sector								
Greenhouse gas emission reductions from water Subproject	tCO2e / year	0	167,783	335,566	503,349	503,349	Data input by Client, calculation supported by Guarantors*	CWG/Guarantors
Component 2 Energy Sector								
Distribution losses in the targeted DISCOs reduced by at least 5 percent	GWh	LESCO 2,943, MEPCO 2,773, SEPCO 1,330	LESCO 2,918, MEPCO 2,750, SEPCO 1,319	LESCO 2,869, MEPCO 2,701, SEPCO 1,297	LESCO 2,795, MEPCO 2,634, SEPCO 1,263	LESCO 2,795, MEPCO 2,634, SEPCO 1,263	National Electric Power Regulatory Authority Industry Reports, DISCOs' annual reports	ADB
Greenhouse gas emission reductions from energy Subproject	tCO2e / year	0	677,712	1,355,424	2,033,136	2,033,136	Data input by Client, calculation supported by Guarantors*	CWG/Guarantors
Component 3 Health Sector								
Number of people benefiting from improved health facilities/services per year (disaggregated by gender)	# men, # women	0	0	0	men: 3300, women: 3700	men: 3300, women: 3700	Reporting / Data Collection	CWG (PMOF and MOPDSI)
Intermediate Results Indicators								
Number of real-time flow measurements installed and functional along IBIS	#	0	26	26	26	26	Count	CWG (PMOF and MOPDSI)
Addition of Smart Metering Devices at regional distribution companies (DISCOs)	#	0	25,000	75,000	150,000	150,000	Count	CWG (PMOF and MOPDSI)
Additional health system capacity built	# additional beds	0	200	200	500	500	Count	CWG (PMOF and MOPDSI)

*The methodology was developed by ADB and subsequently reviewed and amended by AIIB. It will be incorporated into the POM to validate the results calculated for the Subproject.

**Data to be updated prior to Board approval if necessary.

Annex 2: Eligibility Criteria of Subproject Selection

The sustainable Panda Bond will finance Subprojects that are (i) in line with AIIB's mandate, and (ii) eligible under Pakistan's Sustainable Financing Framework (PSFF), issued in May 2025. Only those eligible categories under the PSFF that align with AIIB's mandate will be considered under this Project. Based on the pipeline shared by PMOF, AIIB's Partial Debt Guarantee (PDG) will support water, energy, and health infrastructure Subprojects assessed to have medium or low E&S risks. Additionally, all Subprojects covered by AIIB's PDG must comply with AIIB's Procurement Policy.

In sum, the Subproject eligibility criteria can be summarized as follows:

- Alignment with PSFF (see column 1 in the table below)
- Consistency with AIIB mandate (see column 2 in the table below)
- Must have medium or low E&S risk classification
- Must adhere to AIIB's Procurement Policy
- Subproject sponsors have previous experience working with AIIB or other peer MDBs (preferable)
- Subprojects are co-financed by the GOP with other MDBs (preferably).

PSFF Eligible Categories	Aligned with AIIB's Mandate Green Categories	Proposed Subproject
Renewable Energy	Yes	Smart Metering for Energy Distribution
Energy Efficiency	Yes	
Pollution Prevention and Control	Yes	Indus Basin Discharge Monitoring
Environmentally Sustainable Management of Living Natural Resources and Land Use	Yes	
Terrestrial and Aquatic Biodiversity Conservation	Yes	
Clean Transportation	Yes	
Sustainable Water and Wastewater Management	Yes	
Climate Change Adaptation	Yes	
Green Buildings	Yes – limited to infrastructure	
Social Categories		
Affordable Basic Infrastructure	Yes	Phase 2 National Cancer Hospital; Phase 1a Jinnah Medical Complex and Research Center
Access to Essential Services – Health Care, Education, Vocational Training, Financial Services	Yes – limited to infrastructure financing	
Affordable Housing	Yes – limited to infrastructure	
Employment Generation	No	
Food Security and Sustainable Food Systems	No	
Socioeconomic Advancement and Empowerment	Yes – limited to infrastructure	

Annex 3: Pakistan Panda Guarantee Indicative Call Process[1]

The following sequence of events adheres to the *New and Amended Product Paper* (NAPP) *Addendum on Privately Place Sovereign Bond* (Addendum 3) and distinguishes three phases: (i) Stand-by, (ii) Call on Guarantee and (iii) Member Reimbursement. The details of each phase may be subject to change following regulatory review and negotiation of the legal documentation.

Sequence of event at repayment:

- **Stand-by phase:** Regular payments of interest and principal by the Pakistan Ministry of Finance (PMOF) to bondholders:

    1. PMOF pays interest and principal into its non-resident account (NRA) at a Chinese domestic bank (NRA account-opening bank), which will likely be the same account used for the issuance proceeds. This should happen at least one day before the coupon and principal due date.

    2. The post-issuance manager[2] (normally the lead underwriter) transfers funds to Shanghai Clearing House (SHCH) based on PMOF's instruction. PMOF may also deposit funds directly into SHCH, if needed.

    3. The SHCH distributes to bondholders accordingly.

- **Call on Guarantee:** If PMOF does not pay the interest and/or principal on time

    1. Triggering event reached as per (to be determined) definition (which is expected to be a certain number of days before the end of the waiting period of the Bond's interest and principal schedule as per the Bond documentation).

    2. Bondholders make a claim to the post-issuance manager of the Bond.

    3. The post-issuance manager collects and delivers all claims to AIIB and ADB (the Guarantors).

    4. AIIB/ADB deposits the guaranteed payments to SHCH. This is expected to occur at least one day before the end of the Bond's waiting period.

    5. SHCH delivers the guaranteed payments to bondholders accordingly.

- **Member reimbursement:**

    1. The Guarantors then will claim the corresponding called amount from PMOF (based on the indemnity agreement between AIIB/ADB and PMOF).

    2. PMOF should then reimburse the guaranteed amount to AIIB/ADB, in accordance with the instructions of each Guarantor—whether payment is required on demand or under other repayment terms are provided—within the agreed waiting period.

[1] Subject to the review of the external counsel after Project Approval
[2] The Post-issuance Manager will be appointed among all the underwriters before the Bond issuance.

Annex 4: Country Credit Fact Sheet

Background: Pakistan is a lower-middle-income country with a GDP per capita of approximately USD1,600 (or USD7,000 in purchasing power parity) and a population of around 240 million. Pakistan's economy grew at an average annual rate of 3.5 percent over the last decade—lagging regional peers due to structural issues such as low investment, including in human capital, low productivity, and chronic fiscal challenges. After mid-2021, macroeconomic instability intensified due to a combination of domestic and external shocks, as well as policy missteps. The sharp increase in global commodity prices due to geopolitical tensions, the severe 2022 flooding, and the acute domestic political turmoil after the 2022 change in government further undermined macroeconomic stability. Delays in the IMF program and concerns about debt sustainability triggered market anxiety, curtailed external financing, and led to a downgrade of Pakistan's sovereign credit rating to the CCC range, pushing yields sharply higher. As a result, growth came to a standstill in FY2023, the rupee depreciated by 50 percent, and FX reserves fell by 75 percent between mid-2021 and mid-2023.

Since mid-2023, Pakistan has resumed engagement with the IMF. The initial nine-month program provided a policy anchor and restored confidence. New official financing, including support from Gulf Cooperation Council bilateral partners, signaled sustained international backing. The program has been implemented effectively and contributed to macroeconomic stabilization. The subsequent 37-month, USD7 billion EFF program, since September 2024, focuses on macroeconomic stability—through fiscal consolidation, tax reform, tight monetary policies, and higher FX reserves—strengthening competitiveness, reforming state-owned enterprises and improving the energy sector. The economy started to recover in FY2024 with higher growth and lower inflation.

Selected Economic Indicators	FY23	FY24	FY25*	FY26*	FY27*	FY28	FY29
Real GDP growth (% change)	–0.2	2.5	2.7	3.6	4.1	4.5	4.5
Inflation (end-of-period, % change)	29.4	12.6	6.5	6.6	6.5	6.5	6.5
Fiscal balance (overall)[a]	–7.7	–6.8	–5.6	–5.1	–3.9	–3.4	–3.2
Public debt*	78.2	70.1	73.6	71.9	70.0	67.0	63.9
Current account balance	–1.0	–0.5	–0.1	–0.4	–0.5	–0.8	–0.9
External debt	34.9	32.2	30.3	30.8	29.9	28.5	27.3
Gross external financing need	7.1	5.4	4.0	4.7	4.5	6.7	4.6
FX reserves (USD billion) [b]	4.4	9.4	14.3	..	..	..	..
Exchange rate (PKR/USD) [b]	287.6	278.3	283.8	..	..	..	,,

Notes: * general government, including IMF obligations; [b] Data from central bank, end-of-period, for FY2025: as of Aug. 25, 2025.
Source: IMF Country Report No. 25/109; in percentage of GDP, unless otherwise indicated; * denotes projections; fiscal year runs July-June.

Recent developments. The IMF has recently completed the first review of Pakistan's program, with overall performance assessed as strong. Pakistan met key program targets, particularly in reserve accumulation and fiscal performance. The budget is on track to meet the full-year target of 2.1 percent primary surplus. Provincial governments implemented increases in agricultural income tax, fulfilling a major reform milestone. The parties also agreed to a new USD1.3 billion RSF program, aimed at strengthening Pakistan's climate resilience.

Inflation dropped sharply (to about four percent in July 2025), although core inflation remains around nine percent. Strong disinflation enabled the central bank to cut the policy rate from a

peak of 22 percent in FY2024 to 11 percent as of August 2025. Meanwhile, FX reserves surpassed targets, rising from USD9.4 billion in August 2024 to USD14.3 billion in May 2025, while public debt fell from 78 percent to 70 percent of GDP.

Outlook and risks. Growth in FY2026 is projected at 3.6 percent. Forecasts for inflation and the current account deficit have been revised downward to 6.5 percent and -0.4 percent, respectively. The narrower current account deficit reflects strong export performance and recovering remittances, supported by improved macroeconomic and exchange rate stability. Over the medium term, it is expected to widen to around one percent of GDP as imports rebound. Reserves are set to further strengthen, aided by multilateral and bilateral financing. For example, the World Bank has recently committed USD20 billion over the next 10 years under its Country Partnership Framework for Pakistan.

The main risks to the outlook include potential slippage in IMF program, political volatility, and social unrest that could derail reforms efforts. The main external risks include higher commodity prices, geopolitical tensions, and elevated global economic policy uncertainty, which could further tighten already constrained global financial conditions. Additionally, Pakistan remains highly vulnerable to climate related risks.

According to the IMF, public debt continues to be sustainable. However, this critically hinges on a decisive implementation of the IMF-supported economic reforms, the gradual resumption of growth and the continued financial support from partners. Under this scenario, public debt remains contained at about 70 percent of GDP by 2027 and declines thereafter. However, 70 percent of GDP remains high compared with peers. Risks to debt sustainability remain elevated, particularly liquidity risks, namely high external financing needs and low FX reserves, at about half of what the IMF deems adequate—while interest payments absorb more than half of government revenue. Debt sustainability could also come under further pressure in case of policy slippage, higher interest rates, lower growth, and exchange rate volatility.

Due to recent macroeconomic improvements, Pakistan’s sovereign credit ratings have been upgraded, with international borrowing spreads narrowing in line with stronger investor confidence. In April 2025, Fitch raised Pakistan’s rating to B– (stable) from CCC, citing progress on fiscal consolidation and structural reforms. Moody’s followed in August 2025, upgrading Pakistan to Caa1 (stable), while S&P lifted its rating to B– (stable) in July 2025, highlighting improved external liquidity, easing inflation, and successful IMF program reviews.

Annex 5: Details on Subprojects

1) Indus Basin Discharge Monitoring Subproject

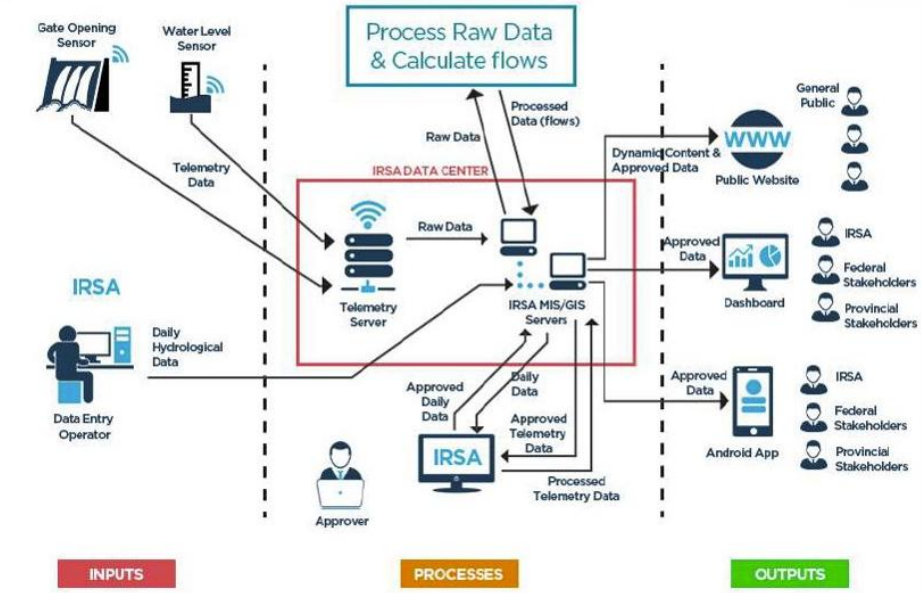
The Subproject aims to establish an accurate and transparent system for water accounting, auditing, and distribution flow monitoring to support the efficient management of Pakistan's Indus Basin Irrigation System (IBIS). The Subproject will strengthen Pakistan's water governance; support early warning and rapid response to flood events; build confidence among provinces in water accounting and distribution; and provide a foundation for efficient, data-driven water management in the face of increasingly severe water scarcity. Table A5.1 summarizes key project information.

Table A5.1: Key Information of the Indus Basin Discharge Monitoring Subproject

Total Project Cost	USD85 million
Financing by GOP	USD85 million, of which USD76 million is financed by Bond proceeds
Other Financing Sources	None
Project Description	**History:** IRSA/WAPDA installed the first telemetry system in 2003, which remained operational for more than a decade. However, due to factors such as the non-availability of spare parts, insufficient O&M funding, and lack of institutional ownership, the system eventually became nonfunctional. In 2023, IRSA agreed with the Ministry of Water Resources (MOWR) to install a batch of new telemetry equipment at 26 monitoring sites across the four provinces of Punjab, Sindh, Khyber Pakhtunkhwa, and Baluchistan. GOP has already financed 30 percent of the civil work. **Workstreams:** 1) Installation of field equipment: Procurement and installation of gauging sensors and associated communication devices at 26 sites across four provinces 2) System integration and commissioning: Testing, calibration, and operationalization of a real-time flow measurement and data transmission system, linking all sites to a central data center 3) Data management infrastructure: Establishment of a national real-time data center and 10 regional monitoring centers to provide access to flow data and water allocation information. **Technical Description:** Figure A5.1 shows the proposed system workflow in detail. The IRSA telemetry system integrates gate opening and water level sensors with a central data center, where raw data are processed into validated flow information through Management Information System (MIS) servers. Data are subject to IRSA approval before being disseminated via dashboards, a public website, and a mobile application, ensuring real-time transparency and accessibility for the public and IRSA, national, and provincial stakeholders. This system strengthens water accounting, enhances interprovincial trust, and supports more efficient management of IBIS.

Status	Under implementation: 90 percent of equipment procured, 30 percent of civil work is completed.
Expected Implementation Period	Scheduled completion in Q1 2027
Implementing Agency	WAPDA
O&M	WAPDA will manage O&M during the one-year defects liability period and for the subsequent two years, after which IRSA will assume O&M responsibility. According to the PS-I, a total of 313 staff will be engaged for the O&M monitoring unit.

Figure A5.1: Detailed System Workflow



Source: MOWR Presentation, September 2025.

2) Smart Metering for Energy Distribution Subproject

The Subproject aims to enhance the efficiency, transparency and financial sustainability of electricity distribution in Pakistan through the deployment of Advanced Metering Infrastructure at three selected DISCOs. The system will enable real-time consumption monitoring, accurate billing, and improved revenue collection, thereby reducing technical and commercial losses and strengthening the financial viability of the DISCOs. It will strengthen customer trust through transparent billing, which is also a critical step in the digitization of Pakistan's electricity sector. Table A5.2 summarizes key information of the Subproject.

Table A5.2: Key Information of the Smart Metering for Energy Distribution Subproject

Total Project Cost	USD271 million
Financing by GOP (Counterpart financing)	USD71 million, fully financed by Bond proceeds
Other Financing Sources	USD200 million by ADB

Project Description	**History:** ADB's first engagement in Pakistan's power distribution sector began in 2008 with a multi-tranche financing facility (MFF), [a] which included components for the installation and upgrading of metering systems, as well as improvements to billing and collection processes. A second MFF, launched in 2015, [b] focused on deploying smart grid infrastructure in major cities and key industrial and commercial hubs. Under this Subproject, approximately six million customers, substations and transformers in the target areas will be equipped with smart metering systems. **Workstreams:** 1) Procurement and installation of over 300,000 Advanced Metering System (AMS), 150,000 of which will be financed by the Bond proceeds 2) 15,800 DISCO-side Asset Performance Monitoring System (APMS) devices will be procured and installed 3) Associated civil works. **Technical Description:** AMI systems, comprising AMS and APMS, are designed to improve operational efficiency, reduce losses, and enhance the financial and technical performance of DISCOs. AMS enables remote reading, outage detection, and theft identification while providing consumers with real-time usage data and utilities with improved load forecasting and billing accuracy. APMS monitors distribution transformers, combining smart metering and protective devices to safeguard assets, enables predictive maintenance, and identifies technical and commercial losses.
Status	Procurement of AMI devices is ongoing
Expected Implementation Period	Q1 2026 to Q4 2028
Implementing Agencies	Lahore Electric Supply Company (LESCO), Multan Electric Power Company (MEPCO), and Sukkur Electric Power Company (SEPCO)
O&M	Under the ADB Power Distribution Strengthening Project, Subproject management units (PIUs) have been established within each participating DISCO. The PIUs are responsible for Subproject implementation, monitoring, and subsequent O&M of all smart grid infrastructure. In addition, ADB and the Subproject contractors will provide training programs to DISCO staff to ensure the smooth and effective operation of the system.

[a] ADB. *Proposed Multitranche Financing Facility – Islamic Republic of Pakistan: Power Distribution Investment Program. Report and Recommendation of the President to the Board of Directors.* August 2008. Link.
[b] ADB. *Proposed Multitranche Financing Facility – Islamic Republic of Pakistan: Second Power Distribution Enhancement Investment Program. Report and Recommendation of the President to the Board of Directors.* October 2015. Link.

3) Phase 2 National Cancer Hospital Subproject

The Subproject seeks to expand access to quality health care services in Pakistan, focusing on specialized cancer diagnosis and treatment. The procured equipment will serve an estimated 12 million people in the catchment area of Islamabad. Beyond service delivery, it will also support capacity development by providing training opportunities for health care professionals, thereby helping address the shortage of specialized oncology expertise in Pakistan.

Table A5.3: Key Information of the Phase 2 National Cancer Hospital Subproject

Total Project Cost	USD26.9 million
Financing by GOP	USD26.9 million, fully financed by Bond proceeds
Other Financing Sources	None
Project Description	**Background:** Development of the National Cancer Hospital is divided into two phases. Phase 1, comprising civil and electrical works for the construction of the hospital complex, commenced in mid-2023 and covers the basement and three additional floors, with provisions for expanding by two further floors. This Subproject represents Phase 2 of the project and focuses on the procurement of medical equipment and furniture. **Workstreams:** Procurement of specialized equipment and furniture for a 200-bed dedicated cancer diagnosis and treatment facility. **Technical Description:** The Subproject will support the establishment of a 200-bed oncology hospital at the Pakistan Institute of Medical Sciences through the procurement of advanced diagnostic, therapeutic and support infrastructure. The hospital is designed as a multilevel structure (basement + three floors + provision for an additional two floors in the future) and will provide comprehensive oncology services that are highly subsidized compared to private hospitals. The facility will have a total capacity of 200 beds for inpatient care, with dedicated divisions for adult oncology, pediatrics, gynecology, intensive care, private rooms and emergency services. A day-care chemotherapy unit will offer 40 treatment chairs. Operations will run 24/7, with systems in place to manage biomedical, chemical and radioactive waste, as well as the high energy requirements of specialized medical equipment. The Subproject will procure equipment in five packages with the budget approximately allocated across functions as follows:

Component, Approximate % Budget Share	**Function**
Diagnostic & Imaging, 84%	- State-of-the-art radiology services, including MRI, CT, PET-CT, X-ray, angiography, and image-guided biopsy facilities - Supported by pathology and hematology laboratories and a blood bank.
Outpatient & Daycare Service, 1%	- Outpatient department and the emergency department - Day-care chemotherapy facility with 50 treatment chairs for chemotherapy, biological and targeted therapies
Inpatient, Critical Care Surgical & Procedural Services, 5%	- 200 patient beds distributed across adult oncology, pediatric oncology, gynecologic oncology, intensive care unit, private wards, emergency care - Intensive care and general ward equipment

Support and Ancillary Facilities, 9%	- Central gas and vacuum system - Laundry and mortuary facilities - Incinerator for biomedical waste - Administration, library, auditorium, dining hall, and electrical substation

The hospital is expected to treat 7,000 patients per year upon completion. The number of patients is anticipated to increase to 16,000 in the two years following completion.

Status	Physical progress under Phase 1 stands at 80.5 percent, while financial progress is 56.2 percent. For Phase 2 (medical equipment), the procurement plan is divided into five packages, with IFB scheduled for December 2025, contract awards are expected in Q4 2026, and installation targeted for Q1 2027.
Expected Implementation Period	Phase 2 to be completed by Q1 2027
Implementing Agency	Pakistan Institute of Medical Sciences (PIMS)
O&M	PIMS

4) Phase 1a Jinnah Medical Complex and Research Center Subproject

The Subproject seeks to address Islamabad's rapidly growing population and the resulting strain on aging public hospitals by establishing a modern, high-capacity health care facility that meets international standards. The Jinnah Medical Complex and Research Center Company (JMCRCC) will enhance health care delivery, strengthen medical education and research, and attract both domestic and international professionals to mitigate the loss of skilled talent.

Table A5.4: Key Information of Phase 1a Jinnah Medical Complex and Research Center Subproject

Total Project Cost	USD270 million
Financing by GOP	USD270 million, of which USD76.1 million to be financed by the Bond proceeds
Other Financing Sources	Public allocations and municipal taxes

Project Description	**Background:** The JMCRCC project will be implemented in two phases, with the Subproject covering Phase 1a and providing an initial capacity of 300 beds. The hospital will subsequently expand through Phase 1b and Phase 2 to reach its full planned capacity of 1,200 beds. Phase 1a will cover the hospital podium, three bed towers, the administrative block, parking, and other support facilities. **Workstreams:** Development of Phase 1a, a hospital complex with an operational capacity of 300 beds **Technical Description:** The hospital complex will be constructed on a 600-kanal site on public property in Islamabad's H-16 district, about 1.2 km southeast of the Kashmir (Srinagar) Highway, with direct connectivity to Islamabad International Airport, and approximately 5.2 km from the M-1/M-2 motorways, enabling convenient access from Peshawar and Lahore. Its strategic location near national highways and the airport positions the facility to serve both domestic patients and regional medical tourism markets. Phase 1a is divided into two contracts to ensure that 300 beds can be used initially and the remaining 900 beds can be added subsequently during Phase 1b and Phase 2. EPC Contract 1: Hospital building/podium, administration building, auditorium, physical plant, warehouse, grid station, underground parking, service tunnel, roadways and landscaping (hospital front). EPC Contract 2: Bed towers (1, 2, 3).
Status	Procurement of the Phase 1a EPC contractor is under way, and the contractor is expected to be on board by the end of 2025. Full financing for Phase 1a has been secured from the GOP budget.
Expected Implementation Period	Phase 1a is proposed for 30 months after the EPC contract is awarded.
Implementing Agency	Jinnah Medical Complex and Research Center Company (JMCRCC)
O&M	JMCRCC

Annex 6: Reporting and Monitoring

	Report	Timing	Responsibility
Financial Management	Audited Project Consolidated Financial Statements	Not later than six months after the closure of the fiscal year	PMOF/CWG (WAPDA, JMCRCC, LESCO, SEPCO, MEPCO)
	Audited Entity Financial Statements	By the earlier of (i) the time prescribed for their approval under the country's laws or (ii) one month after their approval by the relevant authority	WAPDA, JMCRCC, LESCO, SEPCO, MEPCO
	Annual Allocation Report	Within one year of the bond issuance	CWG/ PMOF
	Annual External Review Report	Annual Report	CWG/ PMOF
Social and Environment	Environmental Monitoring Report	Semi-annually, within 30 days after the end of each reporting period	PMOF/CWG (WAPDA, JMCRCC, MONHSRC, LESCO, SEPCO, MEPCO)
	Social Monitoring Report	Semi-annually, within 30 days after the end of each reporting period	MOF/CWG (WAPDA, JMCRCC, MONHSRC, LESCO, SEPCO, MEPCO)
Procurement	Procurement Performance Report for the entire program	Semiannual	CWG/PMOF
	Procurement Audit Report for the entire program	Annual	CWG/PMOF
Technical	Semi-annual Project Progress Reports	Semi-annual progress reports, within 30 days after the end of each reporting period	PMOF/CWG (WAPDA, JMCRCC, MONHSRC, LESCO, SEPCO, MEPCO)
	Annual/Midterm Review Mission	Annual and/or midterm review by ADB/AIIB	ADB/AIIB
	Project Completion Report	Not later than six months after physical completion of the project	ADB/AIIB, PMOF/CWG (WAPDA, JMCRCC, MONHSRC, LESCO, SEPCO, MEPCO)

Annex 7: Paris Agreement Alignment and Climate Finance

A. Paris Agreement Alignment

Building Block 1 (BB1): Climate Mitigation Goals

The Bond proceeds will support four sustainable and climate-resilient infrastructure Subprojects in the water, energy and health sectors. Paris Agreement alignment assessments were conducted for each Subproject following AIIB's Paris Agreement alignment methodology for Direct Investment Operations. The Indus Basin Discharge Monitoring and Smart Metering for Energy Distribution Subprojects are classified as universally aligned with mitigation goals, as their operation types are included in the universally aligned list for mitigation—under the "water management" and "T&D" categories, respectively. No further assessment is needed.

Phase 2 National Cancer Hospital and Phase 1a Jinnah Medical Complex and Research Center Subprojects do not fall under the "universally aligned" or the "universally not aligned" lists. A five Specific Criteria (SC1-SC5) assessment as per AIIB methodology was conducted for each.

Equipment for National Cancer Hospital Subproject

SC1-SC2: NDC alignment and **long-term strategy alignment.** Pakistan's Updated Nationally Determined Contributions (NDC) 2021 and low-greenhouse gas (GHG) strategy does not prohibit or rule out procurement of health care equipment.

SC3: Sector-specific alignment. Health care is not a Paris Agreement alignment "high-emission sector." The activity supports social services (health) that are generally neutral/positive for sustainable development.

SC4: Carbon lock-in test. The project is unlikely to lock in fossil fuel–intensive infrastructure and is expected to allow renewable-ready designs. There is no evidence that it supports misaligned activities.

SC5: Economic viability. A 200-bed hospital, with advanced diagnostic and therapeutic equipment, has long-term social value and low risk of becoming stranded due to climate policy. Transition risk is minimal; the asset is an essential health care infrastructure with clear public utility.

Conclusion: The Subproject is aligned with the Paris Agreement's mitigation goals under BB1 based on the SC1-SC5 assessment.

Phase 1a Jinnah Medical Complex and Research Center Subproject

SC1: NDC alignment. Pakistan's Updated NDC (2021) sets national emission-reduction goals across energy, industry, agriculture, forestry and transport. Health system expansion and hospital construction are not inconsistent with the NDC.

SC2: Long-Term Strategy (LTS) Alignment. Pakistan's energy transition and long-term decarbonization strategies aim to reduce fossil-fuel reliance and increase renewable integration. Hospital infrastructure is not excluded, but large medical facilities can be energy-intensive (cooling, HVAC, sterilization, labs). The Subproject company has indicated that the project will adopt energy-efficient building standards and renewable-ready design.

SC3: Sector-specific alignment. The health sector is generally neutral or positive, as medical services themselves do not drive lock-in of fossil-fuel technologies.

SC4: Lock-in test. Construction of a large hospital cluster implies high lifetime energy use. However, the project company has implied that various carbon reduction measures, such as onsite rooftop solar photovoltaic generation, Leadership in Energy and Environmental Design (LEED) certification for all buildings, water recycling, rainwater harvesting, wastewater treatment, and solid waste disposal, will be integrated into the detailed project design.

SC5: Economic viability. Hospitals are essential social infrastructure and unlikely to face stranded-asset risk from decarbonization policy. According to economic analysis, the Subproject is economically viable.

Conclusion: The Subproject is aligned with the Paris Agreement alignment's mitigation goals under BB1 based on the SC1-SC5 assessment.

Building Block 2 (BB2): Climate Adaptation Goals

Adaptation alignment was carried out for each Subproject as per AIIB's three-step methodology. Physical climate risk assessments indicated limited risks for the Indus Basin Discharge Monitoring Subproject and Equipment for National Cancer Hospital Subproject, requiring no further assessment. A medium-level climate risk rating and medium-high level rating were identified for the Phase 1a Jinnah Medical Complex and Research Center Subproject and Smart Metering for Energy Distribution Subproject, respectively. Therefore, detailed climate risk and adaptation assessment (CRAs) were conducted for these two Subprojects. The following is a summary of adaptation alignment assessments for these two projects.

Smart Metering for Energy Distribution Subproject

Step 1. Climate risk and vulnerability context

The assessment leveraged credible databases, data and tools, including IPCC's Fifth Assessment Report (AR5), World Bank Group's Climate Change Knowledge Portal,[3] the Climate Risk Country Profile for Pakistan, the Global Change Impact Studies Centre under the Ministry of Climate Change of Pakistan, and various literature sources. Climate projections were primarily based on the Coupled Model Intercomparison Project Phase 6 (CMIP6) model ensemble under Representative Concentration Pathways (RCP) 2.6 (low emissions) and RCP 8.5 (high emissions) scenarios over the mid-21st century (2046-2065). The assessment identified key climate hazards include floods, droughts and heatwaves, rainfall-induced landslides and wildfires.

1. **Floods**. As the climate model ensemble shows an increase in maximum five-day rainfall and precipitation intensity, the risk of flood occurrence is ranked medium to high across the project locations, with the highest risk being observed in the Lahore and Multan DISCO clusters. Heavy rains and floods can undermine the structures through increased erosion and damage electrical equipment through short circuiting.

[3] World Bank Group's Climate Change Knowledge Portal website. Link.

2. **Droughts and heatwaves**. A high increase in extreme temperatures and a moderate increase in the number of continuous dry days put the project locations at high risk of droughts and heatwaves. The average temperature is expected to increase by 2ºC and 4ºC in the future, which will adversely affect electric grid operations. Transmission lines and substations are sensitive to high temperatures as they directly impact the control systems and lead to increased transmission losses by lowering the current rating and enhancing the sagging of lines. Droughts may also cause additional damage to the infrastructure because of dust accumulation and settling.

3. **Rainfall-induced landslides**. The overall risk of landslides in the project locations is classified as low since most parts of the three clusters consist of flat terrain. However, the western ends of the three clusters exhibit risk because of the presence of mountainous range. Consistent increases in precipitation-related extremes in the future will likely increase the risk of landslide activity in the region.

4. **Wildfires**. The risk ranges from medium to high across three DISCO clusters as maximum temperatures are expected to increase, raising the likelihood of wildfires. Such incidents can cause irreversible damage to the T&D system.

Step 2. Climate adaptation and resilient measures

1. **Improving infrastructure design.** Measures such as the use of more effective cooling systems, temperature-resilient conducting materials, and improved cables can significantly reduce the damage caused by high temperatures and floods. Protective measures such as increasing the plinth height of substations above recorded maximum flood levels can help protect the infrastructure. Similarly, building retention walls near substations can reduce the system's vulnerability to the impact of landslides.

   Improved drainage and slope assessment can further minimize the damage caused by floods. To minimize transmission losses and reduce the risk of sagging lines, the distance between transmission towers should also be decreased. Additional transmission circuits should be built to reroute power in case of a fault.

2. **Adopting modern tools to support informed adaptation actions.** Installing monitoring systems, such as APMS and AMI, can significantly improve the reliability of transmission operations. Similarly, expansion of the hydrometeorological monitoring network can help identify different climate risks and develop early warning systems. Setting up additional weather stations can lead to improved surveillance and understanding of changes in climatic conditions.

3. **Enhancing the capacity of DISCOs.** Emergency response teams should be established and trained within DISCOs to prevent infrastructure damage in the event of fires or flooding. Technical staff should be trained to use systems such as APMS to monitor distribution efficiency. A specialized team should also be trained to develop hydrological models to assess risks and to monitor and forecast disasters for improved risk management.

Step 3. Consistence with broader national context for climate resilience

The project is aligned with Pakistan's revised NDCs. The implementation of the aforementioned adaptation measures will enhance the climate resilience of the electric T&D system. Pakistan's Vision 2025 recognizes reliable, clean and affordable energy access as a driver of sustainable growth. Moreover, Pakistan aims to reduce its emissions by 50 percent of its recorded levels in 2016 by the year 2030 as per its NDCs (2021). The project is aligned with the national efforts aimed at building climate resilience and ensuring access to affordable and clean energy for all (SDG 7).

Phase 1a Jinnah Medical Complex and Research Center Subproject

Step 1. Climate risk and vulnerability context

The assessment defined climate risks as a function of hazard, exposure and vulnerability as per the IPCC Sixth Assessment Report risk framework. Regional and global datasets or tools, such as Climate Change Knowledge Portal, Water Stress Index, Agricultural Stress Index, and Fire Weather Index, were used. Climate projections for precipitation, temperature and dry spells were drawn from CMIP6 climate models across the 2040-2059 horizon under both moderate (SSP2-4.5) and high-emission (SSP5-8.5) scenarios. The assessment identified five primary climate hazards: heatwaves, floods, wildfires, drought and water scarcity, and rainfall-induced landslides.

Findings indicate that JMCRCC is most exposed to heatwaves, which are expected to intensify in frequency and severity as regional temperatures rise by 1-2°C in the coming decades. Flood and wildfire risks are considered medium: Although the hospital is outside flood plains and away from dense vegetation, localized flooding from intense rainfall could overwhelm drainage systems, and wildfire could threaten critical infrastructure such as power lines. Risks from drought and landslides are assessed as low, although prolonged dry periods could strain water supplies needed for sanitation, cooling, and fire suppression, while landslides could disrupt ambulance access routes.

Vulnerability analysis shows that several hospital components are highly sensitive to climate hazards. Floods could damage ground-level infrastructure, electrical and mechanical systems, and medical waste facilities. Heatwaves pose major threats to cooling systems, medicine storage, staff efficiency, and patient safety. Rising mean temperatures will further increase energy demand, putting pressure on backup systems. Droughts may reduce water availability for essential hospital operations, and wildfires, while less directly threatening, could indirectly affect hospital services by damaging nearby energy and communication infrastructure.

Overall risk ratings classify heatwaves as the highest concern, both currently and in future scenarios. Floods and wildfires carry medium risks, while landslides and droughts remain low. Given these findings, the report emphasizes the importance of incorporating climate adaptation measures into the hospital's design, operations and governance

Step 2. Climate adaptation and resilient measures

The recommended adaptation strategies to be integrated into the detailed project design fall into four categories.

1. **Improving infrastructure design.** Conduct slope and drainage assessments; enhance stormwater management; use reflective roofing, insulation, and natural

ventilation to mitigate heat stress; develop green roofs and permeable pavements; install solar panels or hybrid generators; and elevate critical equipment with retaining walls.

2. **Adopting technological tools.** Deploy heat- and humidity-resilient ICT components; integrate extreme weather alerts into hospital protocols; establish digital health platforms for service continuity; and install smart lighting, HVAC, and energy-efficient medical equipment.

3. **Capacity building.** Train staff in emergency response; conduct disaster preparedness drills; provide shaded areas and property, plant and equipment (PPE) for outdoor workers; equip staff rooms with cooling systems; maintain critical backup power inventories; and deliver health and safety training for extreme heat events.

4. **Strengthening governance and financing**. Institutionalize periodic vulnerability assessments; integrate climate resilience into procurement and facility management; allocate dedicated funds for adaptation and emergency upgrades; and ensure alignment with national and provincial climate adaptation policies.

The assessment concludes that while JMCRCC is a vital investment for Pakistan's health care system, its long-term viability depends on proactive climate resilience planning. Without adaptation, heatwaves and associated energy and cooling demands pose the most severe threat. However, by integrating structural, technological and institutional measures, the facility can significantly reduce risks and safeguard essential medical services for future generations.

Step 3. Consistence with broader national context for climate resilience

The Project is assessed as consistent with Pakistan's national and sectoral adaptation priorities, including its updated NDCs, National Climate Change Policy (NCCP), and National Adaptation Plan and Framework of Action for Climate-Resilient Health Systems.

1. **Updated NDCs.** Pakistan's updated NDCs, as presented in 2021, emphasize its commitment to reducing GHG emissions and enhancing resilience to climate change impacts. While the primary focus has been on mitigation efforts, the NDCs also acknowledge the critical need for adaptation strategies, particularly in sectors like health.

2. **National Adaptation Plan 2023.** The National Adaptation Plan serves as Pakistan's primary road map for climate adaptation, emphasizing resilient development and risk mitigation. It aims to integrate climate considerations into various sectors, including health, by enhancing local capacities and promoting sustainable infrastructure. This approach is intended to foster collaboration among government bodies, the private sector, and civil society to address climate challenges effectively.

3. **National Climate Change Policy (NCCP) 2012.** The NCCP prioritizes adaptation over mitigation, recognizing the vulnerability of sectors like health to climate impacts. It outlines policy measures to strengthen health system resilience, including enhancing disease surveillance, improving health care infrastructure, and promoting public health education.

4. **Framework of Action for Climate-Resilient Health Systems (2023).** This framework, developed under the guidance of MONHSRC, outlines strategies to integrate climate considerations into health systems. It includes conducting climate-health vulnerability assessments, developing contingency plans, and enhancing disease surveillance systems.

B. CLIMATE FINANCE

Following the Joint MDB Common Principles for Climate Mitigation and Adaptation Finance Tracking, climate finance is calculated for the four Subprojects.

Indus Basin Discharge Monitoring Subproject

Climate Adaptation Finance: In accordance with the joint MDB methodology for tracking adaptation finance, the following criteria were applied to identify eligible adaptation activities.

Criterion 1: Context of climate risk and vulnerability

The Subproject is clearly set in a climate-vulnerable context. Pakistan's IBIS is highly vulnerable to climate change impacts, including (i) increased frequency and intensity of floods by glacial melt and extreme rainfall; (ii) irrigation stress due to changing hydrology, variability in river flows, and demand–supply mismatch; and (iii) water disputes and inequitable allocation exacerbate vulnerability of farmers, particularly smallholders. The National Water Policy 2018 and the Flood Telemetry Masterplan explicitly recognize climate risks, such as floods, droughts, and water scarcity, and emphasize the need for improved monitoring and early warning systems.

Criterion 2: Explicit statements of intent to reduce identified climate vulnerabilities and/or enhance climate resilience

The Subproject clearly demonstrates an explicit intent to reduce water-related climate vulnerability and strengthen resilience. The project design aims to reduce vulnerability and enhance resilience by providing timely and reliable flow data, which decreases the exposure of farmers and authorities to water allocation shocks; supports equitable water allocation to address social and livelihood vulnerabilities under water stress; and enhances public safety through improved early warning and rapid response to floods. These are core resilience outcomes that go beyond co-benefits, forming a central part of the project's objective.

The Subproject's adaptation objective is further reflected in the Results Monitoring Framework (Annex 1), including the key indicator: number of real-time flow measurements installed and functional along IBIS.

Criterion 3: Direct and logic link between project activities and identified climate vulnerabilities

The Subproject demonstrates a clear and logical link between its activities and the climate vulnerabilities it seeks to address. By installing telemetry systems and establishing real-time dashboards, the Subproject directly targets key vulnerabilities in IBIS. Flood risks are addressed through enhanced early warning enabled by the provision of real-time hydrological data. Water allocation disputes and inefficiencies are reduced through transparent monitoring

and strengthened oversight mechanisms. Irrigation inefficiencies, particularly in times of climate stress, are addressed by providing farmers with reliable data to better manage scarce water resources. This cause–effect chain—monitoring technology leading to improved data, enabling better allocation and preparedness and reducing vulnerability—is direct, logical and fully consistent with the adaptation rationale.

Type of adaptation activities: As adaptation and climate resilience are the objectives of the Subproject, it is classified as a Type 3 Adaptation activity. A proportional approach is applied to estimate the share of the project cost that qualifies as adaptation finance. The Bond proceeds allocation on the Subproject of USD76 million is estimated as climate adaptation finance. As AIIB will provide 44 percent guarantee for the Subproject, proportionally, USD33.44 million is counted as AIIB's climate mitigation adaptation finance.

Smart Metering for Energy Distribution Subproject

Climate mitigation finance: By providing real-time data on energy consumption, AMI enables DISCOs to better monitor and optimize energy use, thereby reducing GHG emissions. It also facilitates the integration of renewable energy sources such as solar and wind into the grid, improving supply-demand matching and reducing dependence on fossil fuels. In line with the joint MDB Common Principles for Tracking Climate Mitigation Finance, the Subproject is qualified as climate mitigation finance under the "Brownfield efficiency improvement or reduction of CO_2 emissions in transmission or distribution of electricity, heat, cold, low-carbon gases, or CO_2" category. Given that the total AMI cost is USD72.5 million and AIIB will contribute to approximately 50 percent of the AMI devices and provide a 44 percent guarantee for the Subproject, USD15.95 million is counted as AIIB's climate mitigation finance.

Phase 1a Jinnah Medical Complex and Research Center Subproject

Climate adaptation finance: In accordance with the joint MDB methodology for tracking adaptation finance, three criteria were applied to identify eligible adaptation activities.

Criterion 1: Context of climate risk and vulnerability

Please refer to details in BB2 Step 1 assessment.

Criterion 2: Explicit statements of intent to reduce identified climate vulnerabilities and/or enhance climate resilience

The project is expected to integrate climate resilience into its design and operational planning. Adaptation measures include improving infrastructure design, adopting technological tools, building capacity, and strengthening governance and financing, as outlined in BB2 Step 2 assessment. These measures aim to reduce the exposure of hospital operations, equipment and patients to climate hazards, demonstrating clear intent to enhance climate resilience.

Criterion 3: Direct and logic link between project activities and identified climate vulnerabilities

The adaptation measures demonstrate a direct cause–effect relationship with the identified vulnerabilities. Stormwater drainage improvements and elevated infrastructure reduce flood impacts on critical systems, while resilient HVAC systems, smart equipment, and reflective

building materials mitigate heat stress on patients, staff and pharmaceutical storage. ICT tools and early warning systems ensure continuity of services during extreme weather events, and staff training coupled with emergency drills strengthens operational resilience across all hazards. Together, these activities create a clear logical pathway in which project interventions reduce exposure and sensitivity, thereby enhancing resilience to heatwaves, floods, droughts, rainfall-induced landslides, and wildfires.

Type of adaptation activities: As adaptation and climate resilience are not the main objective of the activity, it is classified as a Type 1 adaptation activity. A proportional approach is applied to estimate the share of the project cost that qualifies as adaptation finance. Both nonstructural and structural measures were identified to address climate vulnerabilities. Fifteen percent (USD11.42 million) of the Subproject cost (USD 76.1 million) is estimated as climate adaptation finance. As AIIB will provide 44 percent guarantee for the Subproject, USD5.02 million is considered as AIIB's climate adaptation finance.

In Summary: Of the AIIB-guaranteed Bond proceeds, USD54.41 million is considered climate finance, including USD15.95 million for climate mitigation and USD38.46 million for climate adaptation. Below is a detailed breakdown.

Subproject	**Bond Proceeds Allocation** (USD million)	**Climate Mitigation Finance** (USD million)	**Climate Adaptation Finance** (USD million)	**Total Climate Finance** (USD million)	**AIIB's Guaranteed Share** (%)	**AIIB Climate Mitigation Finance** (USD million)	**AIIB Climate Adaptation Finance** (USD million)	**Total AIIB Climate Finance** (USD million)
Indus Basin Discharge Monitoring	76	0	76	76	44%	0	33.44	33.44
Smart Metering for Energy Distribution	71	72.5 * 50% = 36.25	0	36.25	44%	15.95	0	15.95
Phase 2 National Cancer Hospital	26.9	0	0	0	44%	0	0	0
Phase 1a Jinnah Medical Complex and Research Center	76.1	0	76.1 * 15% = 11.42	11.42	44%	0	5.02	5.02
Total (USD million)	**250**	**36.25**	**87.42**	**123.67**	**54.41**	**15.95**	**38.46**	**54.41**