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INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT
ON A
PROPOSED CREDIT

IN THE AMOUNT OF SDR 76.4 MILLION
(US\$98 MILLION EQUIVALENT)
CONCESSIONAL CREDIT

AND

US\$194 MILLION NON-CONCESSIONAL CREDIT FROM THE IDA20 SCALE-UP WINDOW

TO THE

ISLAMIC REPUBLIC OF PAKISTAN

FOR THE

SINDH WATER AND AGRICULTURE TRANSFORMATION PROJECT

December 5, 2022

Water Global Practice
Agriculture and Food Global Practice
South Asia Region

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CURRENCY EQUIVALENTS

(Exchange Rate Effective October 31, 2022)

Currency Unit = Pakistan Rupee

PKR 220.75 = US\$1

US\$1.28 = SDR 1

FISCAL YEAR

July 1 – June 30

Regional Vice President: Martin Raiser

Country Director: Najy Benhassine

Regional Director: John A. Roome

Practice Manager: Josses Mugabi, Oliver Braedt

Task Team Leader(s): Greg J. Browder, Francois Onimus, Olivier Durand

ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
ADU	Agriculture Delivery Unit
AED	Anti-encroachment Drive
AM	Accountability Mechanism
AWB	Area Water Board
BISP	Benazir Income Support Programme
CCDR	Country Climate and Development Report
CERC	Contingent Emergency Response Component
CPF	Country Partnership Framework
CPS	Country Partnership Strategy
DA	Designated Account
ECoP	Environmental Code of Practice
ERR	Economic Rate of Return
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standards
FAO	Food and Agriculture Organization
FERC	Flood Emergency Rehabilitation Component
FM	Financial Management
FO	Farmers' Organization
FY	Fiscal Year
GAP	Gender Action Plan
GCF	Green Climate Fund
GDP	Gross Domestic Product
GFCRP	Global Food Crisis Response Program
GHG	Greenhouse Gas
GoP	Government of Pakistan
GoS	Government of Sindh
GRS	Grievance Redress Service
HAI	Hydro-Agro Informatics
IBIS	Indus Basin Irrigation System
IDA	International Development Association
IPF	Investment Project Financing
IT	Information Technology
IUFR	Interim Unaudited Financial Report
IWRD	Irrigation and Water Resources Department
IWRM	Integrated Water Resources Management
KWSSIP	Karachi Water and Sewerage Services Improvement Project
M&E	Monitoring and Evaluation
MIS	Management Information System
NAM	New Accounting Model

NDMA	National Disaster Management Authority
NGO	Non-governmental Organization
O&M	Operations and Maintenance
OP	Operational Policy
PBA	Performance-based Allocation
PBC	Performance-based Condition
PCAS-W	Pakistan Center for Advanced Studies in Water
PCMU	Project Coordination and Management Unit
PDD	Planning and Development Department
PDNA	Post-Disaster Needs Assessment
PDO	Project Development Objective
PIC	Project Implementation Consultancy
PISC	Project Implementation and Support Consultants
PIU	Project Implementing Unit
PMC	Project Management Consultancy
POM	Project Operations Manual
PPSD	Project Procurement Strategy for Development
PSC	Project Steering Committee
QCBS	Quality and Cost-based Selection
R&E	Research and Extension
RAP	Resettlement Action Plan
RoW	Right-of-Way
RPF	Resettlement Policy Framework
SAGP	Sindh Agricultural Growth Project
SARB	Sindh Agriculture Research Board
SBIP	Sindh Barrages Improvement Project
SEP	Stakeholder Engagement Plan
SFD	Sindh Food Department
SFEHRP	Sindh Flood Emergency Housing Reconstruction Project
SFERP	Sindh Flood Emergency Rehabilitation Project
SIAPEP	Sindh Irrigated Agriculture Productivity Enhancement Project
SIDA	Sindh Irrigation and Drainage Authority
SMART	Strengthening Markets for Agriculture and Rural Transformation
SME	Small and Medium-sized Enterprise
SMRP	Social Management and Resettlement Plan
SSWP	Sindh Strategic Water Plan
SUW	Scale-up Window
SWAT	Sindh Water and Agriculture Transformation
SWMO	Sindh Water Management Ordinance
tCO2e	Tons of Carbon Dioxide Equivalent
UN	United Nations
WB	World Bank
WBG	World Bank Group
WCA	Water Course Association
WSIP	Water Sector Improvement Project

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DATASHEET

BASIC INFORMATION				
Country(ies)	Project Name			
Pakistan	Sindh Water and Agriculture Transformation Project (SWAT)			
Project ID	Financing Instrument	Environmental Assessment Category		
P167596	Investment Project Financing	A-Full Assessment		
Financing & Implementation Modalities				
<input type="checkbox"/> Multiphase Programmatic Approach (MPA)	<input checked="" type="checkbox"/> Contingent Emergency Response Component (CERC)			
<input type="checkbox"/> Series of Projects (SOP)	<input type="checkbox"/> Fragile State(s)			
<input checked="" type="checkbox"/> Performance-Based Conditions (PBCs)	<input type="checkbox"/> Small State(s)			
<input type="checkbox"/> Financial Intermediaries (FI)	<input type="checkbox"/> Fragile within a non-fragile Country			
<input type="checkbox"/> Project-Based Guarantee	<input type="checkbox"/> Conflict			
<input type="checkbox"/> Deferred Drawdown	<input checked="" type="checkbox"/> Responding to Natural or Man-made Disaster			
<input type="checkbox"/> Alternate Procurement Arrangements (APA)	<input type="checkbox"/> Hands-on Enhanced Implementation Support (HEIS)			
Expected Approval Date 19-Dec-2022	Expected Closing Date 31-Dec-2028			
Bank/IFC Collaboration No				
Proposed Development Objective(s)				
To increase agricultural water productivity in Selected Farmers' Organization command areas, improve integrated water resources management, and contribute to restoring crop production by small and medium-sized farmers affected by the 2022 floods.				



Components

Component Name	Cost (US\$, millions)
Component 1: Water Resources Management	17.00
Component 2: Water Service Delivery	128.10
Component 3: Targeted Agricultural Incentives and Investments	65.50
Component 4: Project Coordination and Monitoring	11.40
Component 5: Agricultural Flood Emergency Rehabilitation	98.00
Component 6: Contingent Emergency Response	0.00

Organizations

Borrower:	Islamic Republic of Pakistan
Implementing Agency:	Province of Sindh

PROJECT FINANCING DATA (US\$, Millions)

SUMMARY

Total Project Cost	320.00
Total Financing	320.00
of which IBRD/IDA	292.00
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Development Association (IDA)	292.00
IDA Credit	292.00

Non-World Bank Group Financing

Counterpart Funding	28.00
Local Govts. (Prov., District, City) of Borrowing Country	28.00

**IDA Resources (in US\$, Millions)**

	Credit Amount	Grant Amount	SML Amount	Guarantee Amount	Total Amount
Pakistan	292.00	0.00	0.00	0.00	292.00
National Performance-Based Allocations (PBA)	98.00	0.00	0.00	0.00	98.00
Scale-Up Window (SUW)	194.00	0.00	0.00	0.00	194.00
Total	292.00	0.00	0.00	0.00	292.00

Expected Disbursements (in US\$, Millions)

WB Fiscal Year	2023	2024	2025	2026	2027	2028	2029
Annual	70.00	15.00	25.00	30.00	50.00	62.00	40.00
Cumulative	70.00	85.00	110.00	140.00	190.00	252.00	292.00

INSTITUTIONAL DATA**Practice Area (Lead)**

Water

Contributing Practice Areas

Agriculture and Food

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	● Substantial
2. Macroeconomic	● High
3. Sector Strategies and Policies	● High
4. Technical Design of Project or Program	● Substantial
5. Institutional Capacity for Implementation and Sustainability	● Substantial



6. Fiduciary	● Moderate
7. Environment and Social	● High
8. Stakeholders	● Moderate
9. Other	
10. Overall	● High

COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

[] Yes [✓] No

Does the project require any waivers of Bank policies?

[] Yes [✓] No

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	✓	
Performance Standards for Private Sector Activities OP/BP 4.03	✓	
Natural Habitats OP/BP 4.04	✓	
Forests OP/BP 4.36	✓	
Pest Management OP 4.09	✓	
Physical Cultural Resources OP/BP 4.11	✓	
Indigenous Peoples OP/BP 4.10	✓	
Involuntary Resettlement OP/BP 4.12	✓	
Safety of Dams OP/BP 4.37	✓	
Projects on International Waterways OP/BP 7.50	✓	
Projects in Disputed Areas OP/BP 7.60	✓	

Legal Covenants

Sections and Description



Project Steering Committee: PA, Section I.A.2 to Schedule: The Project Implementing Entity shall establish within one (1) month from the Effective Date, and maintain throughout the period of the implementation of the Project, the Project Steering Committee led by the Chairperson of the PDD and be comprised of experts in adequate numbers and under terms of reference satisfactory to the Association, and be vested with the responsibility of: (i) overseeing the Project; (ii) coordinating various agencies involved in the Project; and (iii) ensuring cooperation of these agencies in executing Project activities.

Sections and Description

Project Operations Manual: PA, Section I.B.1(a) to Schedule: The Project Implementing Entity shall prepare and promptly furnish to the Association for its review, and adopt, by no later than one (1) month after the Effective Date, a Project Operations Manual in a manner and substance satisfactory to the Association, setting out detailed arrangements and procedures for implementation of the Project.

Sections and Description

Smart Subsidiary Grant: PA, Section I.E.1 to Schedule: The Project Implementing Entity shall, through the Agriculture Department, review and approve applications for the Smart Subsidy Grants in accordance with criteria acceptable to the Association and set forth in the Smart Subsidy Manual, and thereafter monitor and evaluate, all in accordance with the provisions of Part E of the PA and the Smart Subsidy Manual.

Sections and Description

FERC Manual: PA, Section I.F.1 and 2 to Schedule: The Project Implementing Entity shall, through the Agriculture Department, review and approve applications for the Cash Transfer in accordance with criteria acceptable to the Association and set forth in the FERC Manual, and thereafter monitor and evaluate, all in accordance with the provisions of Part F of the PA and the FERC Manual. The Project Implementing Entity shall make any Cash Transfer to an eligible small and medium sized farmer in accordance with the procedures set forth in the FERC Manual.

Sections and Description

Subproject RAPs and the Akram Wah SMRP: PA, Section I.G.1.4(b) to Schedule: The Project Implementing Entity shall ensure that all measures are taken to implement the Subproject RAPs and the Akram Wah SMRP, in a manner and timeframe satisfactory to the Association.

Conditions

Type Disbursement	Financing source	Description
	IBRD/IDA	<p>(a) for payments made prior to the Signature Date, except that:</p> <p>(i) for Non-concessional Credit (Credit No. 7255-PK) withdrawals up to an aggregate amount not to exceed \$20,000,000 may be made for payments made prior to this date but on or after July 1, 2022, for Eligible Expenditures under Category (1)(a);</p> <p>(ii) for Concessional Credit (Credit No. 7254-PK) withdrawals up to an aggregate amount not to exceed SDR 30,560,000 may be made for payments made prior to this date but on or after July 1, 2022, for Eligible Expenditures under Category (3);</p>



Type Disbursement	Financing source IBRD/IDA	Description <p>(b) under Category (1)(b) for Goods, works, non-consulting services, Incremental Operating Costs, Training and consulting services for Eligible Expenditures for PBCs (EEPBCs) under the Parts 1 through 4 of the Project, until and unless the Recipient has furnished evidence satisfactory to the Association that the PBC indicated in the Annex to this Schedule has been met;</p>
Type Disbursement	Financing source IBRD/IDA	Description <p>(c) under Category (2) for Smart Subsidy Grant under Part 3.2 of the Project, until and unless the Smart Subsidy Manual, satisfactory to the Association, has been adopted by the Project Implementing Entity;</p>
Type Disbursement	Financing source IBRD/IDA	Description <p>(d) under Category (3) for Cash Transfer, services and Incremental Operating Costs under Part 5 of the Project, until and unless the FERC Manual, satisfactory to the Association, has been adopted by the Project Implementing Entity; or</p>
Type Disbursement	Financing source IBRD/IDA	Description <p>(e) under Category (4) for Emergency Expenditures under Part 6 of the Project, unless and until all of the following conditions have been met in respect of said expenditures: (i) (A) the Recipient has determined that an Eligible Crisis or Emergency has occurred, and has furnished to the Association a request to withdraw Financing amounts under Category (4); and (B) the Association has agreed with such determination, accepted said request and notified the Recipient thereof; and (ii) the Recipient has adopted the CERC Manual and Emergency Action Plan, in form and substance acceptable to the Association</p>



I. STRATEGIC CONTEXT

A. Country Context

1. **Over the past two decades, Pakistan has achieved significant poverty reduction, but human development outcomes have lagged, and economic growth has remained volatile and slow.** Expansion of off-farm economic opportunities and the increase in migration and associated remittances allowed over 47 million Pakistanis to escape poverty between 2001 and 2018. Despite rapid poverty reduction, human capital outcomes have remained poor and stagnant, with high levels of stunting at 38 percent and learning poverty at 75 percent.¹ Pakistan has also experienced frequent macroeconomic crises due to a growth model based on private and government consumption, with productivity-enhancing investment and exports contributing relatively little to growth. Growth of per capita gross domestic product (GDP) has been low and volatile, averaging under 2 percent in the last two decades.² Recent unprecedented floods are likely to have serious impacts on poverty, human development outcomes, and economic growth.
2. **In early fiscal year (FY) 2023, Pakistan's economy was undergoing an overdue adjustment as it recovered from the impacts of COVID-19.** Supported by accommodative macroeconomic policies, the economy expanded by 6.0 percent in FY22. Strong domestic demand, low productivity growth, high world commodity prices, and the global economic slowdown contributed to severe external imbalances. Since Spring 2022, the Government of Pakistan (GoP) took measures to constrain aggregate demand, including implementation of a contractionary budget and increases in administered energy prices.
3. **The recent floods have had enormous human and economic impacts.** Pakistan experienced heavy monsoon rains between June and September 2022. The flooding has affected 33 million people, damaged around 9.4 million acres (3.8 million hectares) of crops, and killed an estimated 1.2 million livestock. Limited access to input and output markets and temporary disruptions to supply chains have driven up food prices and added to existing price pressures resulting from reduced agricultural yields and the global rise of food prices. Preliminary estimates suggest that as a direct consequence of the floods, the national poverty rate may increase by up to 4.0 percentage points, potentially pushing around 9.1 million people into poverty. The recently completed Post-Disaster Needs Assessment (PDNA) estimates total damages to be US\$14.9 billion, while total economic losses reached about US\$15.2 billion. Estimated needs for rehabilitation and reconstruction is at US\$16.3 billion, not including new investments beyond the affected areas to strengthen Pakistan's resilience to future shocks.³
4. **The economic impacts of flooding and associated reconstruction needs will make it much harder for the government to implement much-needed economic adjustments required to address structural imbalances.** Growth is expected to reach only around 2 percent in FY23. Due to higher energy prices, a weaker Rupee, and flood-related disruptions to agricultural production, inflation is projected to rise to

¹ World Bank. 2019. "Pakistan: Leaning Poverty Brief." EduAnalytics

<https://thedocs.worldbank.org/en/doc/214101571223451727-0090022019/original/SASSACPAPAKLPBRIEF.pdf>

² World Bank Group. 2022. "From Swimming in Sand to High and Sustainable Growth: A Roadmap to Reduce Distortions in the Allocation of Resources and Talent in the Pakistani Economy." Pakistan Economic Memorandum. World Bank, Washington, DC. p. 1. <https://openknowledge.worldbank.org/handle/10986/38133>.

³ Government of Pakistan. 2022. "Pakistan Floods 2022: Post-Disaster Needs Assessment. Main Report." Ministry of Planning Development & Special Initiatives. <https://thedocs.worldbank.org/en/doc/4a0114eb7d1cecbff2f65c5ce0789db-0310012022/original/Pakistan-Floods-2022-PDNA-Main-Report.pdf>.



around 23 percent in FY23.⁴ With disruptions to exports and higher import needs, the current account deficit is expected to narrow only slightly to around 4.3 percent of GDP in FY23 (from 4.6 percent in FY22). The fiscal deficit is projected to narrow only modestly from FY22 levels to around 6.9 percent of GDP in FY23 (against a budgeted deficit of 4.7 percent), reflecting both negative revenue impacts from flooding and increased expenditure needs.

5. The GoP thus faces a difficult policy challenge in supporting relief and recovery while maintaining progress towards macroeconomic stabilization. Significant downside risks include: (i) additional natural disasters that could further harm output and worsen fiscal and external imbalances; (ii) a slowdown in policy response in the months prior to elections; (iii) worsening external conditions; and (iv) risks associated with large domestic and external financing needs. To manage these risks, it will be critical to adhere to sound overall economic management and buttress market sentiment, including through: (a) articulating and effectively implementing a clear strategy for economic recovery; (b) maintaining overall fiscal restraint, sustaining the roll-back of energy subsidies, and targeting fiscal expenditures towards the most vulnerable, including through enhanced social protection measures; (c) maintaining a tight monetary stance and flexible exchange rate; and (d) progressing critical structural reforms, including reducing collection losses in the energy sector, improving the efficiency of revenue mobilization, and closing tax exemptions. Even with such efforts, post-flood reconstruction needs exceed available fiscal space. Significant private investment will be required, including through efforts to improve the business environment and access to finance, alongside additional international assistance.

6. As the recently published Country Climate and Development Report (CCDR) shows, Pakistan's high vulnerability to climate change is a risk multiplier, compounding its human and economic development challenges. Pakistan consistently ranks among the top 10 countries worldwide most affected by climate change⁵ despite being a relatively minor contributor to climate change at under 1 percent of global greenhouse gas (GHG) emissions in 2018.⁶ Pakistan is especially vulnerable to flooding and the country regularly experiences large-scale flooding, most notably in 2010 and more recently in June 2022. Pakistan faces some of the highest disaster risk levels in the world, ranking 18 out of 191 countries according to the 2020 Inform Risk Index and eighth at risk of flooding. It is estimated that Pakistan's average annual losses to flooding are above US\$1 billion.⁷ Pakistan's climate vulnerability, coupled with the uncertainty surrounding annual glacial melt, average precipitation, and extreme temperature changes, highlights the need for ex-ante disaster preparedness and resilience building.

B. Situation of Urgent Need of Assistance or Capacity Constraints

7. The unprecedented 2022 floods present a situation of urgent need which required adjusting the pre-floods design of the Sindh Water and Agriculture Transformation (SWAT) project, and motivates its processing under Condensed Procedures. Prior to the floods, the project was at an advanced stage of preparation with the development objectives of *increasing agricultural water productivity and improving*

⁴ World Bank. 2022. "Pakistan Development Update October 2022: Inflation and the Poor."

<https://thedocs.worldbank.org/en/doc/51427702c05371f59848a74a2d66ba87-0310062022/pakistan-development-update-october-2022-inflation-and-the-poor>.

⁵ Eckstein, David, Vera Künzel, and Laura Schäfer. 2021. "Global Climate Risk Index 2021." Germanwatch Briefing Paper. <https://www.germanwatch.org/en/19777>.

⁶ World Bank Group. 2022. "Pakistan Country Climate and Development Report." CCDR Series, World Bank, Washington, DC. p. 6 <https://openknowledge.worldbank.org/handle/10986/38277>.

⁷ World Bank Climate Change Knowledge Portal (dataset). "Pakistan." <https://climateknowledgeportal.worldbank.org/country/pakistan>.



integrated water resources management to enhance climate resilience. In the wake of the floods, the Government of Sindh (GoS) requested to augment the project design to include a *flood emergency rehabilitation component* (FERC) while still maintaining the original development objectives. To accommodate the FERC, the other project components and the geographic scope of some activities were scaled down. This decision was based on the following considerations: (i) farmers, the beneficiaries of the project, were significantly affected by the floods, and unless their livelihoods were restored, their ability to adopt new agricultural practices that are key to the original project design would be impaired; (ii) one of the implementing agencies of SWAT, the Sindh Agriculture Department, was tasked with addressing the recovery needs of the farmers facilitating the emergency response; and (iii) the GoS nonetheless wanted to move forward with the project as a key pillar in its efforts to boost climate resilience and build back better. SWAT is thus being processed under Condensed Procedures as per the Bank Procedure on Preparation of Investment Project Financing for Projects in Situations of Urgent Need of Assistance or Capacity Constraints. The project is being prepared and implemented according to OP/BP 10.00 Paragraph 12, Investment Project Financing (IPF) Policy, which allows for certain exceptions to the IPF policy requirements, if the Bank deems the recipient to be in urgent need of assistance because of a disaster or experiences capacity constraints because of fragility or specific vulnerabilities.

8. **Sindh province, especially its agriculture sector, has been devastated by the 2022 floods.** The PDNA estimates that about 70 percent of the total damages and losses happened in the Sindh province. The overall needs assessment for post-flood recovery and reconstruction stands at US\$7.9 billion in Sindh, around half of the national total. The province is estimated to have received rainfall in excess of six times of its average monthly total, and most of the runoff was impounded in the rich agricultural floodplains of Sindh. Reports estimate that more than 4.4 million acres (1.8 million hectares) of agricultural land has been damaged, and 0.8 million livestock perished in the country, with the damages in Sindh contributing to 72 percent of the total value of the damage and losses registered in the sector, which could contribute to food shortages in the near future.⁸ Vast areas in rural Sindh witnessed prolonged inundation lasting several weeks, with floodwater accumulating from other parts of the country following glacial melt in the mountainous north and record monsoon rains nationwide. Stagnant water in several districts has given rise to skin, gastric, and mosquito-borne diseases.

C. Sectoral and Institutional Context

9. **Sindh has a population of 50.4 million people (23 percent of the country's population) and generates 27 percent of Pakistan's GDP.** Nearly half (48 percent) of Sindh's population lives in rural areas and about 37 percent of the rural population lives below the poverty line—higher than the Pakistan average. Poverty rates are much higher in some flood-impacted districts, reaching 53.4 percent in Badin. Satellite and survey data suggest that poorer households were more likely to be affected by the floods. Beyond monetary and non-monetary poverty, areas in Sindh affected by the floods showed some of the highest stunting rates in the country, reflecting limited access to sanitation facilities and clean water. Agriculture accounts for about 24 percent and 70 percent of provincial GDP and employment in Sindh, respectively, and poor households derive 56 percent of their income from agriculture.⁹ Poverty levels in rural Sindh are closely correlated with farm size or tenure relationships, as small farmers tend to have less

⁸ Sindh Provincial Disaster Management Authority. November 15, 2022. "Monsoon 2022 Daily Situation Report (20-06-2022 – 14-11-2022)." https://www.pdma.gos.pk/new/Docs/LDRF_14-11-2022.pdf.

⁹ Government of Pakistan. 2017. "Household Income and Expenditure Survey 2015–16." Pakistan Bureau of Statistics, Islamabad.



access to technologies, credit, water, and support programs.¹⁰ Poor farm households and producers are in urgent need of assistance, but Sindh's agricultural sector requires a deeper transformation to increase productivity and farm incomes and reduce vulnerability to climate change. The SWAT project provides an opportunity to address these challenges simultaneously.

2022 Floods Require Agricultural Emergency Rehabilitation Support

10. **Emergency rehabilitation support for farmers is essential.** The vast majority of farmers lost their summer crops, referred to as Karif crops in Pakistan, which are usually harvested in September-October. Not only did farmers lose their incomes, but many of them fell further into debt as they often rely on credit at the start of the season for the purchase of agricultural inputs such as seeds, fertilizers, land preparation, etc.¹¹ Many small farmers also rely on their crop production to help meet household food security needs. The widespread destruction of crops and loss of livestock is putting a cumulative pressure on overall provincial food security. The GoS considers it imperative to restore agricultural production for the current Rabi cropping season, which generally starts with sowing in October-December and harvesting in April-June. Farmers, particularly small and medium-sized farmers, desperately need financial assistance to help them recover from the floods. The project will help provide this financial assistance through the FERC. Rapid recovery of the agricultural sector in Sindh will also provide a more stable base upon which to pursue the transformational water and agricultural intervention supported by the project.

Irrigated Agriculture Needs to Be Transformed

11. **Irrigated agriculture is the backbone of Sindh's rural economy—77 percent of the net area sown in Sindh is irrigated¹²—but low agricultural water productivity leads to inefficient use of limited water resources.** Sindh is facing significant water scarcity problems, particularly during the summer months before the monsoon. Agricultural water use, which already accounts for around 90% of water withdrawals, is projected to significantly increase if current irrigation and cropping practices are not changed.¹³ Furthermore, current agricultural water use is inefficient, and an estimated 60 to 75 percent of the water withdrawn lost either to surface water evaporation or seepage into saline groundwater.¹⁴

12. **Agricultural productivity in terms of kilograms of product per hectare is generally low in Pakistan, indicating significant potential for increasing yields.** For example, the average yields in Pakistan as a percentage of average yields in China are 52 percent for wheat, 54 percent for rice, 43 percent for cotton, and 81 percent for sugarcane.¹⁵ Low agricultural water productivity, measured in kilograms of crop per cubic meter (crop per drop) or revenue per cubic meter (Rupee per drop), is driven by a combination of factors. First, low-value and water-thirsty crops account for 80 percent of cropped land. Second, crop

¹⁰ Approximately 83 percent of farms are smaller than 12.5 acres (5 hectares) but account for only 37 percent of all farmland; and approximately 20 percent of farmland, mainly on the larger farms, is cultivated based on sharecropping or leases. See: Abdul Wajid Rana and Heman Lohano. (forthcoming). "Sindh Water and Agriculture Sector Public Expenditure Review." World Bank, Washington, DC.

¹¹ UN Office for the Coordination of Humanitarian Affairs. November 13, 2022. "Pakistan: 2022 Monsoon Floods - Situation Report No. 11." <https://reliefweb.int/report/pakistan/pakistan-2022-monsoon-floods-situation-report-no-11-11-november-2022>

¹² Abdul Wajid Rana and Heman Lohano (forthcoming). "Sindh Water and Agriculture Sector Public Expenditure Review." World Bank, Washington, DC.

¹³ Government of Sindh. 2018. *Sindh Agriculture Policy: 2018–2030*.

¹⁴ Government of Sindh. "The Irrigation Management Strategy for Irrigated Agriculture of Sindh, Province (Pakistan), Fourth Draft" Planning and Development Department, Sindh Government, p. 37 (unpublished)

¹⁵ Government of Sindh. "The Irrigation Management Strategy for Irrigated Agriculture of Sindh, Province (Pakistan), Fourth Draft" Planning and Development Department, Sindh Government, p. 37 (unpublished)



yields for major crops are approximately 15–20 percent lower than global averages. Third, water management practices such as over-irrigation at the head of canals result in water logging, soil salinization, and downstream water scarcity. Irrigation water tariffs (*Abiana*) do not cover the cost of providing irrigation services, and they have not been revised since 1999, contributing to chronic under-maintenance and poor service delivery.¹⁶

13. Sindh's multipurpose canal system needs to be modernized in terms of infrastructure, operations, and institutions to meet the needs of agriculture, cities, and industry in the context of a growing population, expanding economy, and changing climate. Sindh's multipurpose canal network depends entirely on the Indus River. It serves agricultural, industrial, urban, and rural users through three large barrages that divert approximately 48 million acre-feet (59 billion cubic meters of water), 90 percent of which is used to irrigate a gross command area of roughly 14.3 million acres (5.8 million hectares).¹⁷ Irrigation management principles in Pakistan, particularly in Sindh, were established during the colonial period and have not fundamentally changed since then. The original operating principle was to distribute water proportionally on a rotating basis and according to water availability in the Indus River, with the amount of water allocated to each watercourse based on its area. The goal was to promote the production of essential crops to help ensure food security. The system was designed for traditional flood irrigation methods that result in high nonbeneficial water losses and are not amenable to many high-value, water-thrifty crops. Due to infrastructure deterioration and management deficiencies, the irrigation system cannot even meet the original principle of equitable distribution. Direct outlets, which are outlets from the central canal that provide water to only one farmer rather than multiple farmers, have multiplied in number over the past decades and give a significant advantage to their beneficiaries in accessing water during periods of scarcity. Since much of the agricultural land is flat with low natural drainage, poor drainage is a severe impediment to crop production. Half of the command area lacks adequate drainage facilities. High water losses at the farm level and canal seepage have resulted in water logging and salinization, with close to 30 percent of agriculture land salt affected.¹⁸ Much of the groundwater in Sindh has high levels of salinity, although a thin lens of freshwater provides an essential source of drinking water for rural communities and supplemental irrigation.¹⁹

14. Existing irrigation and water management laws are outdated and do not provide an enabling framework for integrated water resources management (IWRM). The Irrigation Act of 1879 is Sindh's primary legal instrument governing irrigation and drainage. In 2002, the Government of Sindh (GoS) adopted the Sindh Water Management Ordinance (SWMO) to introduce participatory irrigation management. The SWMO created the Sindh Irrigation and Drainage Authority (SIDA), Area Water Boards (AWBs), and Farmers' Organizations (FOs). AWBs are envisioned to be semi-autonomous organizations that provide canal water based upon main canal command areas. The AWBs provide water to FOs which are composed of representatives of Water Course Associations (WCAs) that manage the irrigation network as the lowest level. Typically, a WCA covers around 250 hectares, and there around 25 WCAs in

¹⁶ Abdul Wajid Rana and Heman Lohano (forthcoming). "Sindh Water and Agriculture Sector Public Expenditure Review." World Bank, Washington, DC.

¹⁷ Sindh Irrigation and Drainage Authority. November 2012. "Preparation of Regional Plan for the Left Bank of Indus, Delta and Coastal Zone." Phase III – Draft Report, The Louis Berger Group Inc. In Association with Indus Associated Consultants (Pvt.) Ltd. <http://sida.org.pk/download/lbg/phaselIII/Volume%20I%20&%20II%20-%20Draft.pdf>.

¹⁸ International Union for the Conservation of Nature. 2007. "Sindh Strategy for Sustainable Development. International Union for the Conservation of Nature." IUCN Sindh Programme Office, Karachi.

¹⁹ Government of Sindh. 2016. "The Irrigation Management Strategy for Irrigated Agriculture of Sindh Province." Planning and Development Department.



an FO. Figure 1 provides a schematic of the Sindh irrigation network.

Figure 1. Sindh Irrigation Hierarchy under the SWMO in Project Area



15. **The SWMO model has been applied to three areas on the Left (East) Bank of the Indus River, around half of the total irrigation area in Sindh, which also corresponds to the project area.** Although the SWMO approach has demonstrated improvements in irrigation services, several deficiencies in the legal framework exist. First, the province has two competing legal regimes (SWMO and the Irrigation Act), which creates ambiguity. Second, the role of SIDA and the AWB within the Irrigation Department remains unclear. Rather than serving as an authority, SIDA has evolved into a change agent for irrigation modernization within the Irrigation Department. AWBs operate as semi-autonomous organizations under the Irrigation Department responsible for the main canal command areas, but their specific roles, functions, and governance structures need to be better defined. Finally, neither the Irrigation Act nor the SWMO provides a solid legal foundation for IWRM as they deal almost exclusively with irrigation.

16. **Apart from the deficiencies in the irrigation infrastructure, existing agriculture policies and practices also impede water productivity.** Despite resource constraints and changing dietary patterns, low-value and water-thirsty crops are prevalent in Sindh.²⁰ Agricultural production in Sindh is dominated by four main crops: wheat (30 percent), rice (22 percent), cotton (17 percent), and sugarcane (9 percent). With rapid urbanization and fast income growth in the country, demand for higher-value, more nutritious food is growing; however, domestic production is not meeting this demand despite Sindh's rich soil, water, wind, and solar resources. Higher-value crops, such as fruits, vegetables, condiments, and flowers, and water-thrifty crops, such as pulses and oilseeds, account for only 22 percent of total cropped land. Over the last decade, the overall percentage of high-value, water-thrifty cropland has decreased.²¹

17. **There are extensive subsidies in Sindh's agricultural sector, which consume considerable fiscal resources.** Major subsidies include: (i) subsidized fertilizer; (ii) lower general sales tax rate; (iii) lower power tariff for agricultural tube wells; (iv) low agricultural water rates; (v) sugar export subsidies; and (vi) wheat procurement. The federal government fully finances the first three subsidy types, and the Sindh provincial government funds the rest, sometimes co-sharing with the federal government. The gross federal and provincial annual subsidies in Sindh's agriculture and irrigation sectors in FY18/19 were

²⁰ Household Income Expenditure Surveys as cited in Abdul Wajid Rana and Heman Lohano (forthcoming). "Sindh Water and Agriculture Sector Public Expenditure Review." World Bank, Washington, DC.

²¹ Abdul Wajid Rana and Heman Lohano (forthcoming). "Sindh Water and Agriculture Sector Public Expenditure Review." World Bank, Washington, DC.



approximately PKR 67 billion (US\$412 million),²² out of which PKR 24 billion (US\$148 million) were provincial subsidies.²³

18. **The wheat procurement subsidy is a drain on Sindh's provincial budget.** The wheat procurement subsidy has increased from PKR 0.7 billion (US\$12 million) in FY05/06 to PKR 11.3 billion (US\$70 million) in FY18/19—approximately 47 percent of all provincial agriculture-related subsidies, with outstanding commodity debt of PKR 150 billion (US\$923 million). The wheat subsidy continued to rise with the increase in support price and total cost of wheat procurement (PKR15.4 billion in 20/21 or US\$98 million). The original wheat procurement program was introduced in the 1950s when Pakistan was a food-deficient country. Today, it benefits large farmers, millers, intermediaries, and banks while penalizing urban consumers and the rural poor, net wheat/wheat flour consumers.

19. **Lack of access to markets and finance also impede the shift to water-thrifty crops.** Smaller individual farmers struggle to take advantage of emerging opportunities unless they receive support from agri-business or farmer groups, which provide assistance and facilitate market access. Small farmers often sell their products to intermediaries immediately after harvest to service their debt despite low prices. This constant financial pressure prevents them from taking risks associated with diversification and moving into new markets to increase their income.

20. **Women could play a significant role in improving agricultural water productivity, but they are currently excluded from decision-making related to cropping or irrigation management.** While women make up 39 percent of the labor force in agriculture,²⁴ there are currently no women in leadership in any FOs, WCAs, or AWBs in the project area.²⁵ Women's exclusion is partly due to social norms and inequalities in access to agricultural assets, resources, and skills. Patriarchal values rooted in local traditions and pre-existing inter-generational inequalities reinforce gender hierarchies. Women's time and energy are limited under double and triple burdens as unpaid caregivers with household and reproductive responsibilities and as low-paid productive workers. The percentage of female professionals in the agriculture and irrigation sectors is low (partially reflecting the low levels of women with academic qualifications,²⁶ particularly in science, technology, engineering, and mathematics fields).²⁷ There is also a lack of female role models within the relevant agencies, and workplace inequities result in low entry and retention rates. SIDA has attempted to help improve the status quo by promoting women farmers groups and requiring female participation in the AWBs and FOs. However, these efforts are still in their infancy.

21. **In 2018, the GoS adopted a new Agriculture Policy that provides a framework for agriculture sector transformation.** This policy aims at: (i) raising the overall growth of the sector to 4–5 percent annually, (ii) reducing rural poverty and malnutrition to half of the current levels, (iii) making efficient use of natural resources—especially water and mitigating environmental impacts while preserving the agro-ecological base; (iv) enhancing climate change resilience and adaptability; (v) diversifying to high-value

²² The exchange rate in June of the cited FY was used to calculate the US\$ figures in this and the subsequent paragraph.

²³ Abdul Wajid Rana and Heman Lohano (forthcoming). "Sindh Water and Agriculture Sector Public Expenditure Review." World Bank, Washington, DC.

²⁴ Ahmad, Nuzhat, and Huma Khan. 2016. "Measuring Women's Disempowerment in Agriculture in Pakistan." IFPRI Discussion Paper 01512.

²⁵ Estimated by SIDA and Agriculture Department. Personal Communication

²⁶ In 2017, 24 percent of women received formal education in rural Sindh compared with 58 percent of men. Government of Pakistan. 2017. "Labour Force Statistics." Pakistan Bureau of Statistics, Islamabad.

²⁷ A World Bank Utility Survey highlighted that out of 17.7 percent women employees in water utilities, women managers make up only 23.3 percent. This trend is also seen in Pakistan. World Bank. 2019. "Women in Water Utilities: Breaking Barriers." World Bank, Washington, DC.



agriculture; and (vi) focusing on effective communication and monitoring and evaluation (M&E). The policy highlights the GoS's intention to (a) liberalize and deregulate the sector and work with commercial lenders and the private sector to enhance investments and finance into agriculture; (b) move public expenditure away from inefficient and ineffective programs; (c) launch agriculture and livestock insurance programs to reduce income variability for farmers; and (d) facilitate and promote technological improvement along the entire value chain, particularly for products such as fresh and processed fruits, vegetables, and livestock products.²⁸ The project will support the GoS in operationalizing the principles embedded in the 2018 Agricultural Water Policy.

Climate and Environmental Crises Call for Integrated Water Resources Management (IWRM)

22. **Sindh faces enormous climate resilience challenges.** Sindh lies at the tail end of the Indus River and is also at the front line of a rising sea. The Indus Basin Irrigation System (IBIS) is heavily dependent on snowmelt and glaciers from the western Himalayas, which will be profoundly affected by a changing climate. Sindh's irrigated agriculture is particularly vulnerable to the following climate impacts: (i) changes in seasonal flow patterns in the Indus River affecting the availability of irrigation water; (ii) reduced productivity of crops and livestock due to heat stress; (iii) increased irrigation requirements due to higher levels of evapotranspiration; (iv) increased frequency and intensity of extreme climate events (floods, droughts); and (v) advancing saltwater intrusion, affecting coastal agriculture, forestry, and biodiversity.²⁹

23. **Lack of integrated water resources management is undermining environmental sustainability and impacting economic growth and public health in Sindh.** Prior to the development of the IBIS, the Indus River was a braided river in its lower stretches supporting a rich riverine habitat, culminating in the world's fifth largest delta with extensive mangrove forests. Agricultural development and the reduction of freshwater flows has caused the Delta to shrink by an estimated 92 percent over the last century.³⁰ Inappropriate agricultural water management has resulted in water logging and salinity that affects around half of the irrigated land, resulting in reduction in yields on the order of 30-50 percent on affected land. A 2015 World Bank study estimated that water-related agricultural soil degradation reduces Sindh's annual GDP by around 2.4 percent, while the loss of mangroves has resulted in an annual loss of 0.7 percent. Natural disasters, including floods and droughts, account for an additional average annual loss of 1.7 percent of GDP.³¹ Water scarcity in the downstream parts of the canal network reduces the supply of water to vulnerable towns and villages, contributing to low levels of public health. Manchar Lake, located on the Right Bank of the Indus River, was once the most important freshwater lake in Pakistan yet it has been rendered biologically dead from saline irrigation return flows that have devastated local communities that once relied on its thriving fisheries.³²

24. **The GoS plans to formally adopt a new Water Policy in 2023.** The water policy addresses many critical sector constraints.³³ It calls for improving multipurpose canal operations, enhancing irrigation

²⁸ Government of Sindh. 2018. *Sindh Agriculture Policy: 2018–2030*.

²⁹ Ahmad, Mobin-ud-Din, Joel P. Stewart, Jorge Peña-Arcibia, and Mac Kirby. 2020. "Sindh Water Outlook: Impacts of Climate Change, Dam Sedimentation and Urban Water Supply on Irrigated Agriculture." CSIRO Technical Report, Sustainable Development Investment Portfolio Project, Australia.

³⁰ Siyal, A.A. (2018). *Climate change: Assessing impact of seawater intrusion on soil water and environment on Indus delta using GIS & remote sensing tools*. US. Pakistan Center for Advanced Studies in Water (USPCAS-W), MUET, Jamshoro, Pakistan

³¹ Sanchez-Triana, Ernesto, et. al (2015) *Sustainability and Poverty Alleviation: Confronting Environmental Threats in Sindh, Pakistan Directions in Development*. World Bank.

³² A. A. Mahessar, et. al (2019), "Impact of Right Bank Outfall Drain-I (RBOD-I) / Main Nara Valley Drain (MNVD) on Manchar Lake, Sindh, Pakistan", *Eng. Technol. Appl. Sci. Res.*, vol. 9, no. 6, pp. 5074–5079, Dec. 2019.

³³ Sindh Water Policy Interdepartmental Technical Working Group. 2022. Draft Final Sindh Water Policy.



service delivery by promoting accountability and transparency and adjusting the financing system to enhance sustainability. The water policy also calls for the formulation of a unified Water Law, the transformation of the Irrigation Department into the Irrigation and Water Resources Department (IWRD), the establishment of a multisectoral Sindh Water Resources Commission, preparing the Sindh Strategic Water Plan (SSWP), and the establishment of a hydrological and agricultural informatics (HAI) program. The project will support the GoS in operationalizing the principles embedded in the new Water Policy.

D. Relevance to Higher Level Objectives

25. **The project is consistent with the World Bank Group's (WBG) Country Partnership Strategy for the Islamic Republic of Pakistan (CPS) FY15–19 (Report No. 84645-PK) discussed by the Board of Executive Directors on May 1, 2014.** The CPS was extended to FY20 under the corresponding May 2017 Performance and Learning Review (Report No. 113574). The preparation of the new Country Partnership Framework (CPF) was deferred in FY21 due to the COVID-19 crisis and paused due to the recent unprecedented and catastrophic monsoon floods. A new CPF is expected to be delivered for the consideration of the Board of Directors in the second half of FY24. The focus areas and objectives of the CPS remain relevant and are reflected in the ongoing engagement in the country. The project will contribute to CPS Outcome 2.2: "Increased Productivity in Farms in Selected Irrigation Schemes;" Outcome 3.2: "Reduced Vulnerability for Groups at Risk;" and Outcome 3.3: "Increased Resilience to Disasters in Targeted Regions." The project is also aligned with the Strategic Country Diagnostic priorities of improving productivity in the agriculture sector and improving the management of water resources.

26. **The project is aligned with the recently published Pakistan CCDR.** Strengthening disaster resilience to both floods and droughts and supporting agricultural recovery from the 2022 floods will help achieve sustainable and equitable growth by ensuring that Pakistan can withstand climate-related risks under different projected climate scenarios. The project is also aligned with the National Climate Change Policy, which aims to improve institutional capacity, coordination, resilient infrastructure, and early warning and response mechanisms with respect to disaster risk management. It is also relevant to Pakistan's Nationally Determined Contribution, which details the strengthening of climate change adaptation, including building resilience through nature-based solutions, improving preparedness, strengthening capacities, and adopting solutions to reduce the loss of life, infrastructure, and livelihoods from disasters.

27. **SWAT will build upon and leverage the WB's deep familiarity and involvement in Sindh's agriculture and water sectors.** The WB has financed several GoS projects related to the water and agriculture nexus. The WB-financed Sindh Water Sector Improvement Project (WSIP, P084302), which closed in 2020, renovated some of the main canal infrastructures on the Left Bank of the Indus River. The project will continue to support the modernization program. The WSIP also funded the start-up of SIDA, AWBs, and FOs. The ongoing Sindh Barrages Improvement Project (SBIP, P131324), financed by the WB and scheduled to finish in 2024, is designed to improve the safety of this vital infrastructure. Building upon the WB-financed project Sindh Agricultural Growth Project (SAGP, P128307), which closed in 2021, the project will help deepen value chains for high-value, water-thrifty crops. The Sindh Irrigated Agriculture Productivity Enhancement Project (SIAPEP, P145813), scheduled to close in 2023, financed on-farm water management investments.

28. **SWAT contributes to the Bank's response to the floods disaster. In total, the Bank is mobilizing over US\$2 billion in financing under three pillars: (i) Respond immediately; (ii) Reconstruction and rehabilitation; and (iii) Resilience.** Under Pillar I, at least US\$350 million has been repurposed and



allocated through the existing portfolio to support the country's emergency response. For Sindh, under Pillars I and II, US\$82 million is available through the ongoing Sindh Resilience Project (P155350), Competitive and Livable City of Karachi Project (P161402), Karachi Water and Sewerage Services Improvement Project (KWSSIP, P164704), and SIAPEP (P145813). Sindh is also benefiting from cash transfers to poor households in the affected districts through BISP, which has been allocated US\$150 million of the portfolio repurposing. Under Pillar II, an estimated US\$1.5 billion has been identified primarily for new operations to support reconstruction, including the Sindh Flood Emergency Rehabilitation Project (SFERP, P179981) and the Sindh Flood Housing Emergency Reconstruction Project (SFEHRP, P180008). SWAT will support Pillar II by helping restore agriculture production by farmers affected by the floods. The SFERP will help rehabilitate critical infrastructure and support livelihoods, while also supporting improved capacity to respond to disasters. The SFEHRP will support the GoS in the reconstruction of multi-hazard resilient housing. Two projects, the Sindh Integrated Health and Population Project (P178530) and the Strengthening Social Protection Delivery Systems in Sindh Project (P178532) that were under preparation in the existing pipeline, were revisited to help address the needs emerging from the public health emergencies in the flood-stricken districts in Sindh while maintaining a balance with broader sector development objectives. Pillar III anticipates further financing needs of US\$500 million to support rehabilitation and longer-term resilience to support Balochistan, the second most flood-affected province. This includes the proposed Balochistan Water Security and Productivity Project (P179227) and the Integrated Flood Resilience and Adaptation Program (P180323).

29. **IDA20 and Scale-up Window (SUW).** The project directly supports the IDA20 Special Theme on Climate Change and the IDA20 cross-cutting themes of: (i) Crisis Preparedness, (ii) Governance and Institutions, and (iii) Technology. Given the demand on Pakistan's allocated IDA Country-Based Performance resources due to the flood emergency, the IDA SUW Regular will be used to finance the non-emergency part of the project (US\$194 million), and normal IDA Performance-based Allocation (PBA) will be used to finance the emergency response part of the project (US\$98 million).

II. PROJECT DESCRIPTION

A. Project Development Objective

PDO Statement

30. **The Project Development Objectives (PDOs)** are to increase agricultural water productivity in Selected Farmers' Organization command areas, improve integrated water resources management, and contribute to restoring crop production by small and medium-sized farmers affected by the 2022 floods.

PDO Indicators

31. **The following indicators will measure the achievement of the PDO:**

- FO subprojects in which agricultural surface water productivity increases by at least 20 percent.
- FO subprojects where the Area Water Board delivers the agreed upon water volumes in compliance with the FO-AWB service agreements.
- Acres of water-thrifty crops supported through the smart subsidy scheme.
- Sindh Strategic Water Plan approved by the Sindh Water Resources Commission.
- Farmers who receive cash transfers and resume agricultural production in 2023.



B. Project Components

32. **Transformation Process.** The project will help kickstart a transformation process that will boost resilience to future climate shocks, such as floods and droughts, through three mechanisms: (i) creating a modern IWRM system; (ii) demonstrating proof of concept in increasing agricultural water productivity for selected FO subprojects; and (iii) adjusting key policies that will provide the enabling environment to scale up these successes in the future. A successful demonstration of significant increases in agricultural water productivity at the FO level will have a transformational impact, potentially leading to replication in other areas of Sindh. The project supports critical policy reforms by using the IPF with Performance-based Conditions (PBC) modality.

33. **The project aligns with Pillars 1, 3 and 4 of the WB's Global Crisis Response Framework.** Specifically, it responds to Pillar 1: Food Insecurity by supporting agricultural rehabilitation in the aftermath of the 2022 floods through Component 5 (US\$98 million) and by increasing agricultural productivity and supporting climate-smart agriculture through Component 3 (US\$55.1 million). The project aligns with Pillar 3: Strengthening Resilience by investing in climate-related water infrastructure in Component 2 (US\$115.5 million). Finally, the project aligns with Pillar 4: Strengthening Policies and Institutions by supporting water resources institutions and policies in Component 1 (US\$15 million) and project coordination and monitoring in Component 4 (US\$8.3 million).

34. **Component 1: Water Resources Management (US\$17 million, of which IDA is US\$15.0 million).** This component establishes a provincial IWRM system. It is interdisciplinary in its activities and will be implemented by the Project Coordination and Management Unit (PCMU) within the Planning and Development Department (PDD) in close collaboration with the Irrigation Department and the Agriculture Department. Improving water resources management helps Sindh province cope with climate change by improving monitoring systems, utilizing adaptive planning approaches that consider climate uncertainty, and improving resilience to floods and droughts. There are three subcomponents.

35. **Subcomponent 1.1: Institutional development for IWRM.** Provision of technical assistance to develop a unified legal framework for IWRM and irrigation services, inform water pricing reforms, and support the transition of the Irrigation Department into an Irrigation and Water Resources Department. The legal framework will be developed through the formulation of a new Water Law to supersede the 1879 Irrigation Act and the 2002 SWMO. This subcomponent will fund studies and consultations to comprehensively reform the *Abiana* system to ensure sustainable operations and maintenance (O&M) of the canal network, provide economic signals in water use, and promote transparency and accountability in the provision of water services to farmers, cities, and industry.

36. **Subcomponent 1.2: Provision of technical assistance for the development of a Sindh Strategic Water Plan (SSWP).** The SSWP will provide a road map for IWRM in the province, focusing on flood and drought management. The SSWP will assess critical water issues, including environmental and social aspects, and propose strategic directions for supporting Sindh's economic development while moving toward long-term sustainability and climate resilience. The SSWP will be institutionalized and updated periodically (every 5–10 years). The PCMU will coordinate the preparation of the SSWP with support from relevant departments, including the Irrigation Department and the Agriculture Department. The SSWP should be formally adopted by the GoS through the to-be-established Sindh Water Resources Commission. Future SSWPs will be prepared under the coordination of the IWRD after it has been strengthened through subcomponent 1.1.

37. **Subcomponent 1.3: Support for HAI program.** Establishment of a hydro-agro informatics



program and associated center to monitor and provide information on water balances, cropping patterns, irrigation requirements and drought and flood monitoring, and other relevant services to various government departments and the public. The program will use a combination of remote sensing and ground-based observations related to water and agriculture parameters. The HAI Center will also be responsible for measuring agricultural water productivity in the selected FO subprojects and evaluating the effectiveness of and lessons learned from project interventions. SIDA will be accountable for the HAI Center operations until the IWRD is established. SIDA will contract a university to help support the HAI Center. Staff from the Agriculture Department will be seconded to the HAI Center to ensure that the agricultural sector requirements are addressed.

38. **Component 2: Water Service Delivery (US\$128.1 million, of which IDA is US\$115.5 million).** This component will improve the performance of the multipurpose canal network and irrigation service to farmers. It is implemented through SIDA, which is under the Irrigation Department. It will improve water use efficiency by better matching water supply with demand and reducing losses, thus boosting climate resilience in the face of shifting seasonal water availability and frequent droughts. The gender activities include increasing the representation of women in AWB, FO, and WCA governing bodies and expanding the representation of female professionals in SIDA. There are four subcomponents.

39. **Subcomponent 2.1: Integrated development of approximately 15 FO areas.** Carrying out of investments related to irrigation and agriculture in the Selected FOs by SIDA through FO Subprojects, including new structures for better water control and water flow measurement, canal reshaping and lining, improving drainage canals, and canal ancillary structures such as footpaths and bridges. This subcomponent will use a community-driven development process to select a package of synergistic irrigation and agriculture investments to improve agriculture water productivity in selected FOs in the Ghotki, Nara, and Left Bank AWBs. Subcomponent 3.1, which is implemented by the Agriculture Department, finances agriculture-related activities such as on-farm water investments and the promotion of climate-smart agricultural activities in the same 15 FOs. An FO Subproject Manual has been prepared and is included in the Project Operations Manual (POM). The FOs will be selected based upon a set of criteria such as: (i) location in the canal network to ensure quality service from the AWBs; (ii) organizational strength of the FOs and willingness to modify its rules and regulations to meet the modernization requirements; (iii) signing a “FO Area Development Plan” with SIDA and the Agriculture Department; and (iv) signing an Improved Water Delivery Agreement with the AWB. This will represent the first effort by the Irrigation and Agriculture Departments to collaborate in the same geographical area to help increase agricultural water productivity. At least two FOs will also be selected for piloting conjunctive management—addressing both surface water and groundwater—with the FO command areas. The improvements in water service will result in a more transparent distribution of the available water and help reduce over-abstraction by larger farmers. This subcomponent and subcomponent 3.1 will support the implementation of the January 2021 amendment to the 2002 SWMO, which mandated minimum participation of at least two women in each AWB, WCA, and FO. These subcomponents will also support female leadership training programs. The project results monitoring framework includes indicators that track the number of women in leadership positions in AWBs, FOs, and WCAs.

40. **Subcomponent 2.2: FO, AWB, and SIDA Capacity Building.** Capacity building of SIDA, AWBs, and Selected FOs, including promoting participatory irrigation management, introducing better water control management practices, improved irrigation scheduling, and increasing accountability of the AWBs and Selected FOs to provide adequate service to farmers. This subcomponent will help drive the irrigation modernization process, including promoting participatory irrigation management, introducing better



water control management practices, improving irrigation scheduling, and increasing accountability of the AWBs and FOs to provide adequate service to farmers. Specific activities include: (i) financing the incremental operating costs for SIDA and the AWBs; (ii) implementing institutional reforms for the AWBs and FOs as outlined in the Sindh Water Policy; (iii) training and development of tools for improving canal operations and irrigation service delivery, and (iv) support for behavioral changes through field level leadership program.

41. **Subcomponent 2.3: Left Bank main canal upgrading.** Upgrading of Akram Wah canal and provision of technical assistance to support SIDA in upgrading the Akram Wah canal. This involves upgrading the Akram Wah canal, a 116-kilometer multipurpose canal on the Left Bank of the Indus River, providing water to 462,000 acres (187,000 hectares) of agricultural land and multiple cities, including Hyderabad—the second largest city in Sindh. This subcomponent will also finance studies for improving the operation of the Left Bank canal network, including new control structures on main canals.

42. **Subcomponent 2.4: Right Bank studies.** Provision of technical assistance for the preparation of investment studies, including the Safeguard Instruments, for the renovation of main canals on the Right Bank of the Indus River. This subcomponent will focus on the three main canals on the Right Bank supplied from Sukkur Barrage (Dadu, Rice, and Northwest Canals) and the Warah branch canal.

43. **Component 3: Targeted Agricultural Incentives and Investments (US\$65.5 million, of which IDA is US\$55 million).** This component promotes the adoption of climate-smart practices for traditional crops such as wheat, rice, cotton, and sugarcane, as well as the transition to higher value, water-thrifty crops such as oilseeds, pulses, fruits, and vegetables. The objective is to increase sustainable productivity, strengthen targeted farmers' resilience, reduce agricultural GHG emissions, and increase carbon sequestration. This component will also support gender equality by ensuring female farmers receive culturally appropriate training, improving their access to finance, and increasing the representation of female professionals in the Agriculture Department. The Agriculture Department will implement the activities through five subcomponents.

44. **Subcomponent 3.1: Integrated development of the same 15 FOs supported under subcomponent 2.1.** Carrying out of investments related to agriculture in the Selected FOs by the Agriculture Department through FO Subprojects for the improvement of on-farm water management, high-efficiency irrigation systems, land leveling, drainage improvements and provision of training on climate smart agriculture practices. The POM includes detailed eligibility requirements for each type of investment with a focus on small and medium-sized farmers. The POM also specifies the cost-sharing arrangements, which generally range from 30 percent to 70 percent cost-sharing by farmers, for each type of investment. This subcomponent will include a strong communication strategy to create awareness. It will finance a comprehensive training program, which will establish demonstration sites, group training of farmers using the farmer field school approach, and post-training support for replicating the practices on their farms. In addition, the subcomponent will train men and women field staff of the Agriculture Department under specially organized “training of trainers” to run the farmer field schools. As presented in the Gender Action Plan (GAP), the project will hold separate sessions for women farmers and disseminate information about training via media channels used by women and men. Participation of women in the WCA structures are discussed in subcomponent 2.1.

45. **Component 3.2: Financing smart subsidy payments to targeted farmers.** Provision of Smart Subsidy Grants to small farmers to provide an incentive for the cultivation of high-value, water-thrifty crops. A smart subsidy approach will be piloted that potentially involves two forms of support: (i) targeted



subsidized seeds for selected crops through an e-voucher system; and (ii) targeted direct income support through the banking system to small farmers growing water-thrifty crops. Eligible expenditures for this subcomponent will be the payment to farmers, either through redeemed e-vouchers or actual cash transfers. In addition, this subcomponent includes activities such as information dissemination targeted toward women to encourage female farmers' participation in the smart subsidy program.

46. **Component 3.3: Improving the agricultural information and technology base.** Improvement of agricultural statistics, crop reporting, market information, and agricultural research, including enhancing salinity and water logging applied research activities. A new Sindh Agriculture Research and Extension (R&E) Policy will be adopted, and an autonomous Sindh Agriculture Research Board (SARB) will be established to plan, coordinate, fund, and monitor the provincial agriculture R&E system with a focus on improving agricultural water productivity. The HAI program developed under subcomponent 1.3 will also provide additional information to support the Agriculture Department functions. Activities financed include works for upgrading extension offices and research laboratories, goods including materials for applied research land reclamation activities and equipment, and technical assistance.

47. **Subcomponent 3.4: Enhancing the agriculture value chain.** This subcomponent supports small and medium-sized farms (under 25 acres or 10 hectares) and agriculture small and medium-sized enterprises (SMEs), prioritizing those located in the vicinity of the integrated FO subproject areas. A framework agreement will be signed with selected suppliers to make the rolling supply of identified technologies (equipment, machinery, infrastructure, materials, etc.) available to small farmers and SMEs. Small farmers will be eligible to receive free technical assistance, but SMEs will be required to provide cost-sharing as outlined in the POM.

48. **Subcomponent 3.5: Implementation support to the Agriculture Delivery Unit (ADU).** The ADU was established in May 2022 with a mandate to support policy formulation and implementation and identify and monitor sector development plans, programs, and projects to achieve the strategic objectives of the 2018 Agriculture Policy. It is responsible for implementing Component 3 with support from various Agriculture Department Directorates. This subcomponent supports the startup of the ADU, including consultant support, equipment, incremental operating costs, and implementation of the relevant GAP activities.

49. **Component 4: Project Coordination and Monitoring Support (US\$11.4 million, of which IDA is US\$8.3 million).** Support to the PCMU for the overall Project coordination and monitoring, ensuring the integration of the components to address the water-agriculture nexus. The PCMU will be assisted by a Project Management Consultancy (PMC) firm and individual consultants for technical, safeguards, procurement, financial management (FM), evaluation, and oversight functions. Through a project-financed technical assistance contract, the Food and Agriculture Organization (FAO) will ensure linkages with their ongoing activities in Sindh, including the Green Climate Fund (GCF)-funded project "Transforming the Indus Basin with Climate Resilient Agriculture and Water Management" and the European Union-funded project "Growth for Rural Advancement and Sustainable Progress." The PCMU will support the Sindh Food Department (SFD) in matters related to wheat procurement and strategic reserve reform through the contracting of consultant services for technical assistance and other related expenditures and will collaborate with the SFD on managing the reform transition process. This component will support continuous evaluation to ensure there will be lessons learned from the interventions proposed in the project.

50. **This component will also lead the preparation and oversee the implementation of Gender**



Enhancement Plans in SIDA, the Irrigation Department, and the Agriculture Department. This includes activities to: (i) promote higher female participation in training; (ii) create a mentorship program led by professional women; (iii) work with universities to create a pipeline of women professionals that will feed into the departments; (iv) develop guidelines for a safe and comfortable work environment for women ensuring appraisals and pay raise for women, flexible working hours, childcare and medical benefits system, sexual harassment reporting mechanisms, etc.

51. **PBCs Related to Components 1–4:** For a predefined amount of eligible expenditures, the GoS must meet the associated PBC for the expenditures to be eligible for Bank financing. The PBCs help ensure the reform dialogue remains front and center during implementation. The value of eligible expenditures subject to PBCs aims to strike a balance between providing incentives while not undermining project financing in the event the challenging reforms are not realized or are delayed. Annex 1 further explains the financial modalities for the PBCs. The following four PBCs are included to help ensure an enabling policy environment that will drive the water and agricultural transformation process in Sindh. The PCMU will be responsible for the verification of all PBCs.

PBC-1: New Water Bill (US\$5 million): The Sindh Law and Parliamentary Affairs Department submits a draft water resources bill for consideration by the Sindh Provincial Assembly that replaces the Irrigation Act (1879) and the Sindh Water Management Ordinance (2002) to create a unified legal framework for IWRM and irrigation services.

52. **Rationale for Water Law PBC:** There are currently two conflicting legal regimes in Sindh province governing the irrigation sector: the 1879 Irrigation Act and the 2002 SWMO. Both laws have significant deficiencies, and the forthcoming Sindh Water Policy calls for replacing them with a unified legal framework that lays out principles and responsibilities for irrigation service and IWRM.

PBC-2: Water Pricing Reform (US\$5 million): The Sindh Irrigation Department undertakes a water pricing reform study and increases *Abiana* rates after due consideration of the study recommendations.

53. **Rationale for Water Pricing PBC:** *Abiana* rates have not increased since 1999, and the irrigation sector suffers from low revenue generation, with all the capital costs and 94 percent of the maintenance costs funded by the GoS's general budget.³⁴ As highlighted in the forthcoming Sindh Water Policy, it is necessary not only to increase rates but also to reassess rate structures, collection methods, and how the funds are utilized. Component 1 will finance a comprehensive water pricing study, after which the water rates will be adjusted according to the study recommendations.

PBC-3: Wheat Strategic Reserve Monitoring (US\$5 million): The Sindh Food Department puts in place a wheat market monitoring system to increase transparency and predictability, and publishes an annual report based on said system for at least two years in a row.

54. **Rationale for Wheat Procurement Reform PBC:** The project facilitates a process of reform in the Sindh wheat procurement system whereby the SFD focuses primarily on maintaining a strategic wheat reserve for food security purposes and allows more flexibility for market forces to determine the price of wheat. This has the potential to reduce wheat procurement subsidies, which will allow the subsidies to

³⁴ Abdul Wajid Rana and Heman Lohano (forthcoming). "Sindh Water and Agriculture Sector Public Expenditure Review." World Bank, Washington, DC.



be redirected for more productive, “smart” agricultural subsidies that promote high-value, water-thrifty crops. The PBC requires the development of a wheat market monitoring system with subsequent publication for two years in a row of annual report to help improve transparency and accountability in the wheat procurement system.

55. **A wheat market monitoring system will be established in the SFD to:** (i) track public and private storage capacity; (ii) track district-level public and private stocks; (iii) track global, regional, and domestic markets for wheat and wheat flour price; (iv) ensure predictability of supply and storage capacity, and monitor domestic and international price; and (v) take prompt mitigating measures to meet any shortages. The SFD will also be supported to better undertake the following activities: (i) wheat standards for grading and branding; (ii) creating a legal and administrative framework for regulating private flour mills to ensure predictability of supply and price stability; (iii) developing a wheat strategic reserve system; and (iv) a plan to retire debt obligations incurred through past wheat procurement activities. Since the SFD is not an implementing entity, technical assistance for the SFD shall be channeled through the PCMU under Component 4.

PBC-4: New Policy on Agriculture R&E (US\$5 million). The Sindh Cabinet adopts a program that: i) increases the provincial budget for agriculture and livestock research as a percentage of Sindh agriculture GDP; and ii) establishes an autonomous SARB with representatives from government, academia, private sector, and farmers to plan, allocate funds, and monitor the provincial R&E system.

56. **Rationale for Agricultural R&E Policy PBC:** The GoS currently only spends about 0.1 percent of its agricultural GDP on research, much of it inefficiently and not well directed. To meet the objectives of the 2018 Sindh Agriculture Policy, the research budget needs to be significantly expanded in line with international standards, which can range from 0.5 percent up to 2 percent. To better direct the research program, a new entity—SARB—will be established, which includes a broad range of stakeholders.

57. **Component 5: Agricultural Flood Emergency Rehabilitation Component (FERC, US\$98 million, financed 100 percent by the IDA concessional credit).** Support to small and medium-sized farmers to help recover from the 2022 floods, including: (a) provision of Cash Transfers to small and medium-sized farmers to enable them to purchase inputs and services; and (b) technical assistance to ensure program implementation, monitoring, and evaluation. Cash transfers will give farmers the flexibility to finance their priority agricultural needs, such as seeds, fertilizer, machinery, land management, etc. The GoS will ensure equity under the scheme by prioritizing small farmers through differentiated allocations based on farm size as specified in the FERC manual. This component will also finance supporting services to facilitate implementation, including communication and social mobilization through non-governmental organizations (NGOs), information technology (IT) design, implementation support to the cash transfer mechanism, and third-party monitoring and verification. The FERC Manual will specify the modalities, including FM and safeguard provisions. An acceptable FERC Manual is a condition of disbursement. Since FERC cash transfers are likely to take place before loan signing, the Financing Agreement includes a provision for retroactive financing.

58. **Component 6: Contingent Emergency Response (US\$0).** Provision of immediate response to an Eligible Crisis or Emergency, as needed. Following an adverse natural event that causes a major natural disaster, the government may request the WB to reallocate project funds to support response and reconstruction.



C. Project Beneficiaries

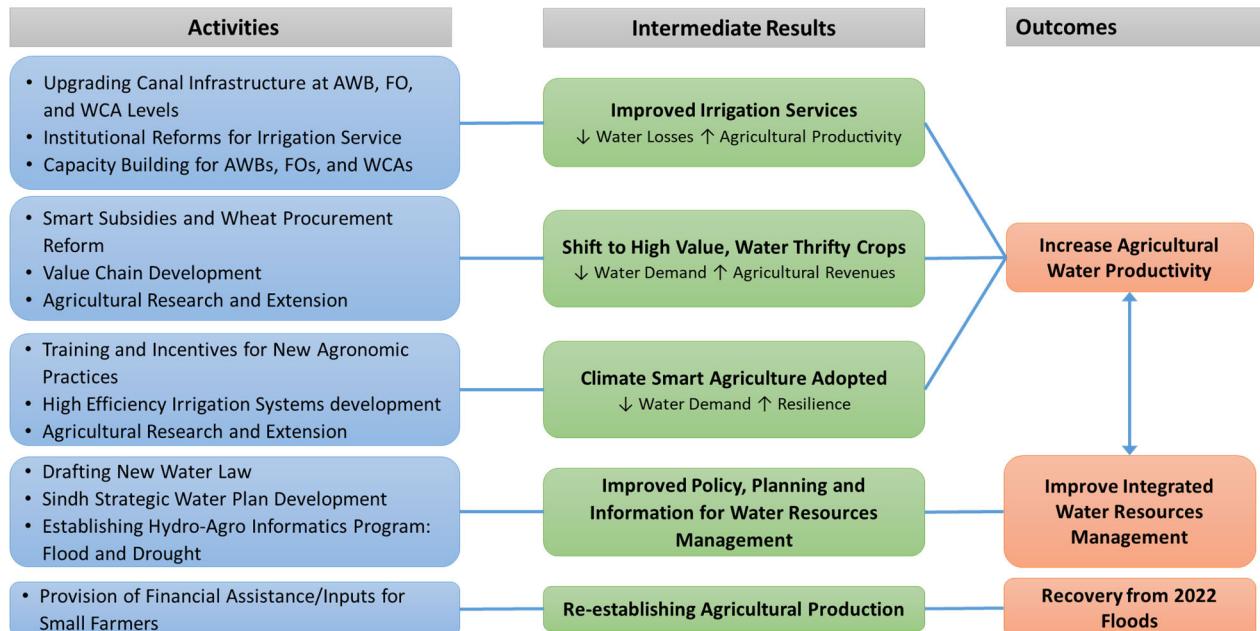
59. The project will directly benefit over 885,000 households (approximately 4.4 million people). An estimated 99% of these households are either small or medium-sized farmers (i.e., less than 25 acres or 10 hectares) with generally low incomes. These households also provide significant employment for landless agricultural workers, who disproportionately fall below the poverty line. Around 20,000 households within the FO subproject areas will benefit from improved irrigation services and agricultural support that will help boost farming income. The project targets small and medium-sized farmers to ensure they can participate equitably and benefit from the FO subprojects. An estimated 14,000 households will receive direct financial benefits from the pilot smart subsidy schemes targeting small and medium-sized farmers. Renovating the Akram Wah canal will benefit approximately 50,000 farming households by improving irrigation water supply reliability in the command area. Improvements in Akram Wah will also help ensure a reliable raw water supply for towns and cities that draw upon the canal, including Hyderabad, which has a population of around 2 million. The FERC will benefit around 800,000 farmer households through the provision of cash transfers. In addition, the project indirectly supports all of Sindh province by helping to implement the 2018 Agricultural Policy and the forthcoming Sindh Water Policy, which will enhance equitable rural development through agricultural growth and promote IWRM.

D. Theory of Change

60. The higher-level objectives of the overall project are to promote rural development, environmental sustainability, and climate resilience. Figure 2 summarizes how the project activities contribute to the three parts of the PDO. Social inclusion is embedded in the program, including promoting women's leadership and ensuring access of women farmers to activities.

Figure 1. SWAT's Theory of Change

Higher Level Objectives: Promote Rural Development, Environmental Sustainability, and Climate Resilience



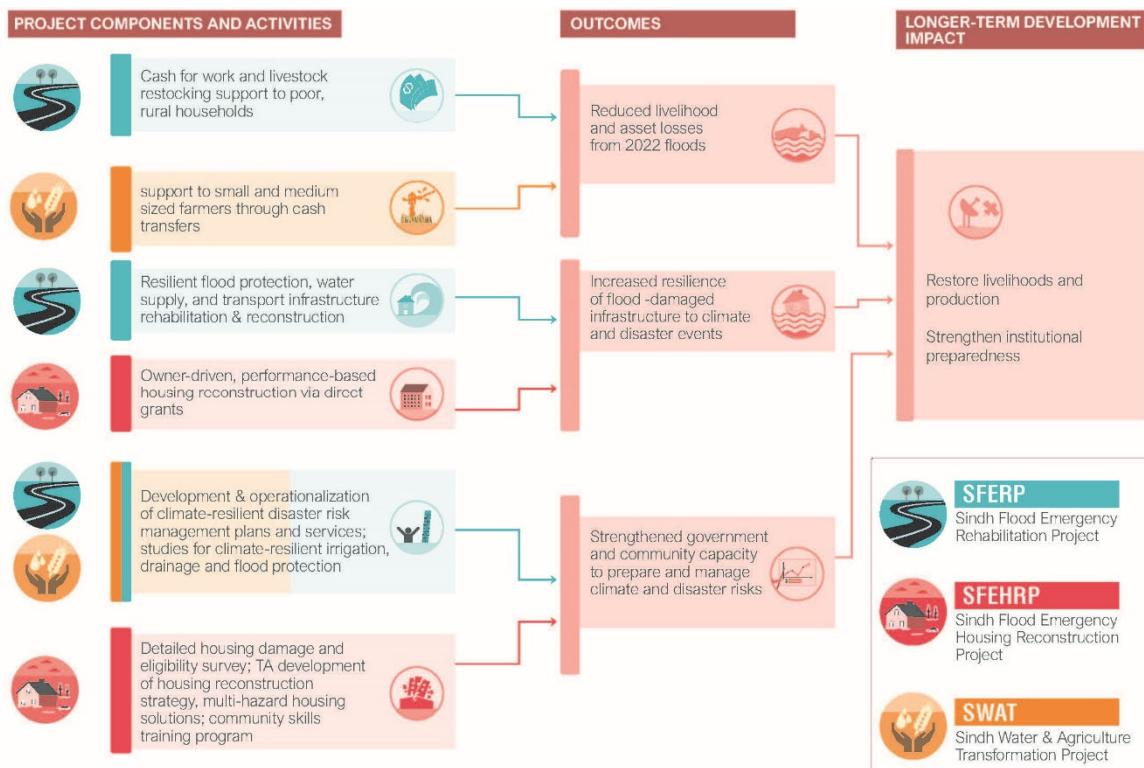


E. Rationale for Bank Involvement and Role of Partners

61. **SWAT is part of a package of three emergency response operations, including the SFEHRP and SFERP.** The SFERP and SFEHRP complement each other in terms of a coherent Bank approach and by incentivizing necessary policy reforms on the government's side, which are critical for the projects' preparedness in the short term and addressing underlying issues on land, water, and agriculture in the longer term. The SFEHRP will be critical to support housing needs in a resilient manner. As most poor farmers are landless and often rely on a few heads of livestock as their store of wealth, the SFERP is an appropriate instrument to implement livestock activities to benefit from its pro-poor impact. SWAT's Agricultural FERC will help small and medium-sized farmers reestablish their crop production through cash transfers. In addition, the SFERP will finance the emergency repairs to critical irrigation and flood protection infrastructure needed to restore production in irrigated farmlands. At the same time, SWAT will contribute to building the longer-term resilience of Sindh province through enhanced management of its water resources and increased agricultural water productivity through synergetic investments in agriculture and improved performance of the irrigation canal network in selected areas. The Bank has a separate dialogue on addressing the livestock sector's medium to long-term needs.

62. **The three emergency operations are a part of the overall Bank flood response effort in FY23.** The Bank's FY23 program focuses across provinces and sectors through repurposing of existing operations, activation of Contingent Emergency Response Components (CERCs), new emergency operations, or pre-flood, planned operations that have been rebalanced to support both flood response and medium-term development objectives.

Figure 2. The Three Sindh Emergency Response Projects





63. **The WB has a long history of partnering with Sindh province in the water and agriculture sectors and is thus well placed to work with the GoS and support the transformation of the agriculture and water sectors.** The FAO recently initiated a national-level GCF-funded project, “Transforming the Indus Basin with Climate Resilient Agriculture and Water Management,” which includes a specific component for Sindh province. The FAO–GCF project will be implemented in parallel with this project, and the FAO is to provide technical assistance to ensure coordination.

64. **The project also complements several ongoing WBG-supported activities aimed at improving service delivery and climate adaptation in Sindh.** Current operations designed to improve water services, solid waste management, and irrigation water management include the Solid Waste Emergency and Efficiency Project (P173021), SIAPEP (P145813), and KWSSIP (P164704). The SBIP (P131324) is renovating the barrages that divert water into the canal network and have an important role in flood management. The Bank is well-placed to leverage implementation experience from the ongoing operations in the design of the three emergency response projects.

65. **The project also complements efforts by development partners to support the country's flood response.** The European Union is providing emergency support in agriculture, livestock, and food security in Sindh. The ADB is helping provide emergency food supplies and preparing operations for the rehabilitation and reconstruction of provincial and district roads, as well as sections of a national highway in Sindh. The ADB is also preparing interventions for livelihood restoration in Balochistan, and irrigation investments in Khyber Pakhtunkhwa and Balochistan. The Japan International Cooperation Agency is supporting livelihood improvement activities for farmers affected by the floods in Balochistan. The FAO is working on agriculture recovery through fertilizer distribution. The International Fund for Agricultural Development is conducting rural development and livelihood support activities in Khyber Pakhtunkhwa. The FAO and ADB may also be working on livestock protection through vaccines and animal feed.

F. Lessons Learned and Reflected in the Project Design

66. **Emergency response.** The FERC draws lessons from the Bank’s experience with the Global Food Crisis Response Program (GFRP) to respond to the 2007–08 Crisis.³⁵ One of the key conclusions is that restoration of crop production in the first season after a disaster is critical to ensuring the sustainability of the farming system. This can be done by ensuring farmers’ access to agriculture inputs to recover from damages and losses of the previous cropping season and to protect the next seasons’ agri-food production outputs. It is also critical to ensure that the most vulnerable are targeted by emergency responses (as proposed under SWAT) through per farm payments declining with farm size. Opting for a cash transfer approach is one of the most appropriate answers to give farmers the flexibility to finance their priority needs, such as input purchase, farming operations, hiring of labor, or addressing debt issues. Cash transfer can also be quickly delivered while preventing procurement and safeguards risks linked to the bulk purchase of agri-inputs. The GFRP experience also showed the importance of linking emergency response with longer-term goals to build back better and strengthen the resilience of agri-food producers.

67. **Co-location.** Previous Bank-financed projects in Sindh supported irrigation investments, such as

³⁵ IEG (Independent Evaluation Group). 2014. “The World Bank Group and the Global Food Crisis: An Evaluation of the World Bank Group Response.” World Bank, Washington, DC.

<https://documents1.worldbank.org/curated/en/543311468323944900/pdf/The-World-Bank-Group-and-the-global-food-crisis-an-evaluation-of-the-World-Bank-Group-response.pdf>; World Bank. 2012. Global Food Crisis Response Program: Progress and Lessons Learned. World Bank, Washington, DC.

<https://documents1.worldbank.org/curated/en/960011468337870506/text/NonAsciiFileName0.txt>



WSIP, and agriculture investments, such as SIAPEP and SAGP, in different geographical areas. The project prioritizes the co-location of these investments, primarily through the FO subprojects, to ensure maximum development impact. Building upon the past experiences, the FO subprojects use a community-driven approach to strengthen participation and help ensure the sustainability of the investments.

68. **Irrigation Service.** Improving the condition of dilapidated main canals and ensuring the safety of dams, such as in WSIP and SBIP, is necessary but not sufficient for enhancing irrigation service. A broader program of irrigation modernization is essential to reap the full benefits of these investments and improve irrigation service. The project thus focuses on enhancing the ability of the AWBs and the FOs to deliver better services by moving from the existing time-based rotational system to a demand-driven volumetric distribution system. This modernization involves new operational concepts, water control structures, and capacity building. The modernization objectives are to better measure flow and distribute water in a more efficient, reliable, and equitable manner to meet user needs.

69. **Value Chain Development.** The experience under SAGP and other Bank-financed agriculture projects in South Asia is that market linkage and private sector participation are critical for expanding and deepening the agricultural value chain for higher-value, water-thrifty crops. Through cost-sharing approaches, the project will thus support farmers and SMEs with a clear business plan, identified buyers, and experienced technical assistance partners for capacity building. The project will also support agricultural warehousing businesses to expand channels from which farmers can access financial services.

70. **Policy Reforms.** The WB-financed Strengthening Markets for Agriculture and Rural Transformation (SMART, P162446) project in Punjab, scheduled to close in 2023, demonstrates the importance of policy reforms in improving agriculture sector performance. The SMART project utilizes the Program-for-Results instrument to help guide the Punjab government through essential policy reforms. SWAT supports many of the same policy reforms and uses the IPF-PBC modality with the PBCs tied to critical reforms in Sindh. One lesson learned from SMART is that reforming wheat procurement is an important but politically complex and sensitive process, and it should be carried out gradually. SWAT, therefore, focuses on helping Sindh improve its wheat monitoring system to promote transparency and accountability rather than requiring the GoS to adopt a specific wheat procurement target. Fostering an appropriate policy environment will help ensure that infrastructure investments and institutional strengthening under the project achieve their full potential.

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

71. **A Project Steering Committee (PSC) will be formally established within one month of loan effectiveness to provide oversight and ensure coordination.** The PSC is headed by the Chairperson of the PDD. The Secretaries of Irrigation and Agriculture are also members of the PSC, along with Secretaries from the Finance Department and SFD. The PSC will meet on at least a semi-annual basis and is supported by a Project Technical Committee composed of Additional Secretaries from the Irrigation Department and Agriculture Department, and the Managing Director of SIDA. To ensure coordination across multiple departments, the PCMU is placed in the PDD and headed by a Project Coordinator and supported by three Directors with responsibilities for irrigation, agriculture, and M&E.

72. **There are three project implementing units (PIUs): PCMU, SIDA, and Agriculture Department.** Since an IWRM system does not yet exist in Sindh, Component 1 will be implemented by the PCMU under



technical leadership from Irrigation Department and in close collaboration with other relevant departments. Component 2 will be implemented by SIDA, which is under the Irrigation Department, and in close cooperation with three AWBs (Ghotki, Nara, and Left Bank) and FOs. Component 3 will be implemented by the Agriculture Department and its various directorates through its ADU, and in close collaboration with the WCAs, research institutes, and SMEs. The ADU will work across the different directorates in the Agriculture Department. Component 4 will be implemented by the PCMU as the overall coordinating agency; the PCMU will also work closely with the SFD, which is responsible for the provincial wheat procurement program. Component 5 will be implemented by the ADU through the Agriculture Extension Directorate.

B. Results Monitoring and Evaluation Arrangements

73. **The POM contains a comprehensive Results Monitoring and Evaluation Framework that contains detailed definitions, methodologies, and responsibilities for monitoring the indicators.** The POM is also included in the project files. Each PIU has its arrangements for M&E and will be supported by the SWAT PMC. In addition, the PCMU will be responsible for consolidating this information into an overall project monitoring report prepared annually.

74. **A combined impact assessment for all three emergency operations—SFERP, SFEHRP, and SWAT emergency flood response components—will also be undertaken to analyze the effect of proposed interventions on female beneficiaries, including female-headed households, over the course of project lifetime.** Using both quantitative and qualitative methods, the study will assess how lives of female beneficiaries have changed post-2022 floods and track their recovery. It will pay particular attention to improvements in: (i) women's socioeconomic conditions, such as increase in their household income, disaster-related debt, and improvement in housing quality; (ii) changes in social relations, such as participation in village activities and level of influence (access to decision-making); and (iii) the extent to which women were able to make a resilient recovery (which also includes increase in knowledge of gender-based violence services in their areas). The findings will help evaluate if the projects were successful in considering the gendered impacts of floods and post-disaster needs of women when achieving medium and longer-term objectives. The results from the assessment can also be useful for the design of future Bank operations as well as potential government policies around disaster risk management, gender, and social protection.

C. Sustainability

75. **The GoS's commitment to ensuring sustainability is reflected in the adoption of the 2018 Agriculture Policy and the forthcoming Water Policy.** These general sector policies highlight the need to undertake transformational changes and underscore the linkages between water and agriculture. They provide the rationale and mandates to undertake the specific policy reforms that are embedded in the four policy-based PBCs.

76. **The project design supports sustainability on multiple fronts.** In Component 1, establishing an institutional framework will help contribute to water-related environmental sustainability. In Component 2, the goal is to move in the direction of a virtuous circle whereby the AWBs provide service to the FOs, cities, and industries on a quasi-commercial basis with transparent service requirements based upon flows; while the water users, in turn, provide payment and hold the AWB accountable for meeting service standards. In Component 3, the smart subsidy program's financial sustainability depends on the GoS's ability to create fiscal space. The goal is to help create this fiscal space by reducing provincial subsidies for



wheat procurement.

IV. PROJECT APPRAISAL SUMMARY

A. Technical and Economic Analysis

77. **Technical.** The project builds upon successful interventions under previous Bank-financed agriculture and irrigation projects, including main canal renovation, on-farm water management investments, and agriculture value chain development. Three new elements are incorporated into the project. First, the piloting of irrigation modernization approaches, both in terms of infrastructure and operations, that have not previously been deployed in Pakistan. Second is an HAI program that uses a combination of remote sensing and ground observations to develop valuable products for agriculture and water management. This will allow Sindh to leapfrog into the information era to better monitor its natural resources and a changing climate. Finally, it will fund an extensive program of applied research on water logging and soil salinization. The knowledge gained through this activity will be shared with farmers through an upgraded agricultural extension program.

78. **Economic Analysis.** A project-level cost–benefit analysis and GHG accounting exercise was undertaken and can be found in the WB project files. The quantifiable benefits expected from the project come primarily from the renovation of the Akram Wah canal and agricultural development in the FO command areas. The analysis indicates that the economic rate of return (ERR) in the base case is 15.3 percent. Sensitivity analyses also demonstrate that the ERR remains robust even in the face of plausible cost increases or benefit reduction. The ERR remains above the social discount rate (assumed to be 9 percent) even if benefits were reduced and costs increased by 20 percent simultaneously or were to lag by two years.

79. **GHG Accounting.** The economic analysis used the Ex-Ante Carbon-Balance Tool to estimate the impact of the project on GHG emissions and carbon sequestration. The results show that the project will constitute a net carbon sink of 460,680 tons of carbon dioxide equivalent (tCO₂e) over 30 years, or 15,356 tCO₂e annually. Carbon sequestration is generated from land-use changes due to the conversion of fallow land to agricultural land made possible through improved irrigation service. Fertilizer and pesticide use in the newly converted agricultural land will marginally increase GHG emissions. Additional carbon sequestration is anticipated with the adoption of climate-smart agriculture practices, but this was not incorporated into the analysis. This includes regenerative agriculture techniques that restore the soil's capacity to draw down and re-sequester excess carbon from the atmosphere and store it in the soil. Following the WB guidance note on the shadow price of carbon in economic analysis, the economic analysis has been done with and without the inclusion of the value of CO₂e, and valued at both lower and upper bands for the social cost of carbon, and had only a marginal impact on the project's ERR.

B. Fiduciary

(i) Financial Management

80. **The project will open three Designated Accounts (DAs)**—one for each PIU, which will be responsible for their payments as per the Financing Agreement. Disbursements will be based on a bi-annual cash forecast provided in the bi-annual interim unaudited financial reports (IUFRs) prepared and submitted individually by each PIU within 45 days of the end of six months. Actual expenditures will be documented in the WB's Client Connection system. In addition, the PCMU will prepare project annual



consolidated FM reports.

81. **The WB performed an FM assessment of the PIUs responsible for the FM functions of this project in accordance with the WB Guidance for FM dated February 28, 2017 and concluded that the FM arrangements are adequate.** Each PIU, based upon their experience with previous Bank-financed projects, has adequate staff and expertise in place. The project will be part of the GoS's annual development budget. The New Accounting Model (NAM), which includes the Chart of Accounts prescribed by the Auditor General of Pakistan, will be used for the project. External audit for the project will be conducted by the Directorate General Audit Sindh, which is a subordinate office of the Auditor General of Pakistan. The Audit Report and Management Letter will be submitted to the Bank within six months of the close of the financial year.

82. **Retroactive Financing.** Cash transfers to farmers under the FERC are programmed to start in early 2023 and proceed rapidly. Per the flexibilities afforded by OP/BP 10.00 Paragraph 12, IPF Policy, the retroactive financing limit for the FERC is set at forty percent of the IDA Concessional Credit amount (US\$39.2 equivalent). The retroactive financing limit for Components 1 -4, which utilize the IDA Non-Concessional Credit, is set at US\$20 million.

(ii) Procurement

83. **Procurement activities will be carried out following the WB's Procurement Regulations for IPF Borrowers (Procurement in Investment Project Financing, Goods, Works, Non-Consulting and Consulting Services – Fourth Edition, November 2020).** Some of the procurement activities may follow the national procurement procedures in Sindh province (national competition) subject to conditions specified in the procurement plan. The project will be subject to the WB's latest Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants (revised as of July 1, 2016, Anti-Corruption Guidelines).

84. **Based upon experience with previous Bank-financed projects, each of the PIUs has considerable procurement capacity.** This will be supplemented with support from the project implementation support consultancies and individual consultants as necessary. The PCMU will be responsible for overall project procurement oversight and maintaining a consolidated procurement plan in the Bank's Systematic Tracking of Exchanges in Procurement System. Also consistent with IPF-PBC modality, the WB Procurement Regulations shall apply on procurable expenditures disbursed under the PBCs.

85. **A Project Procurement Strategy for Development (PPSD) has been prepared, which identifies risks and proposes a strategy for approaching the market.** The PPSD identified risks associated with one of the key contracts under Component 2, which is a large civil works package for the renovation of Akram Wah canal (estimated cost of US\$83 million) divided into multiple lots. SIDA will procure a project implementation consultancy (PIC) for the Akram Wah subproject. The PPSD feeds into an 18-month procurement plan that has also been prepared and corresponds to a value of US\$100 million. Advance procurement has started for critical contracts, including Akram Wah civil works and key consultancies. The details of the procurement arrangement are in Annex 1.

C. Safeguards

86. **The project is rated as Category A.** In accordance with the WB's IPF Financing Policy, Paragraph 9, the project utilizes the Bank's Safeguard policies because the Concept Note was approved in September



2018.³⁶ Project preparation was significantly delayed during 2020–22 due to the COVID-19 crisis. It is rated as a Category A project due to the complexities surrounding the Akram Wah canal rehabilitation subcomponent, which was subject to an anti-encroachment drive (AED) that impacted around 1,246 households during project preparation. In addition, there are two environmentally important technical assistance activities: (i) the SSWP; and (ii) the preparation of a feasibility study, Environmental and Social Impact Assessment (ESIA), and Resettlement Action Plan (RAP) for the renovation of Right Bank main canals. These technical assistance activities have important environmental and social dimensions that need to be considered as part of the planning process.

Environmental and Social

87. **The Akram Wah ESIA identifies potential short-term negative impacts including dust, noise, emissions, traffic, and pollution, which will be mitigated through provisions in the Akram Wah Environmental and Social Management Plans (ESMP).** Around 6,398 trees will need to be cleared and the contractor will be required to replant at least five times as many mature trees in the vicinity of the canal. However, the project activities are not envisaged to degradation or conversion of the riverine forests in Indus River Basin. To minimize loss of permanent wetland habitat and agricultural land, 30 potential borrow pits have been identified within existing barren land/seasonal wetland. To dispose the net excavated quantity of 129,000,000 cubic feet, disposal locations within the canal's right-of-way (RoW) have been identified. Occupational health and safety risks are considered significant and include handling of hazardous materials, electrical works, use of machinery, working at heights, and excavations. For renovation of the Right Bank main canals, it is anticipated there will be considerable land acquisition requirements and potential social legacy issues, which may have been complicated by the recent floods and are yet to be assessed, as well as site-specific environmental impacts that are similar to Akram Wah canal. The FO subprojects will fall into the moderate or low-risk categories and are expected to have no or limited land acquisition requirements potentially requiring an abbreviated RAP. Subcomponent 3.2 and Component 5 may have potential risks related to inappropriate use and disposal of fertilizer and other chemicals, land conversion, and grazing, but they are mostly small-scale and localized.

88. **The following environmental and social instruments have been prepared to mitigate environmental and social risks: the project-wide Environmental and Social Management Framework (ESMF); a Resettlement Policy Framework (RPF); the Akram Wah ESIA; and the Akram Wah Social Management and Resettlement Plan (SMRP).** All local and WB consultation and disclosure requirements have been met, including submission of the Executive Summaries to the World Bank Board of Executive Directors on May 3, 2022.³⁷ The ESMF details the following: (i) environmental and social screening procedures; (ii) standard templates for ESAs (as required) and ESMPs for Components 2 and 3 civil works

³⁶ A Bank internal analysis was undertaken to ensure safeguard approaches under the project are consistent with the Environmental and Social Framework. This analysis is available in the WB Project Files.

³⁷ The draft ESMF and Akram Wah ESIA were disclosed on December 31, 2021, in Pakistan via the PCMU, SIDA, and Agriculture Department websites. The draft executive summaries of the ESMF and the Akram Wah ESIA were disclosed on May 3, 2022, on the WB website and distributed to the WB Board. The final versions of the ESMF and the Akram Wah ESIA were disclosed on November 7, 2022, on both the WB website and the SIDA website. The final Executive Summaries of the ESMF and Akram Wah ESIA in English, Urdu, and Sindhi were disclosed on November 7, 2022 on the SIDA website and on the WB website. The RPF and the Akram Wah SMRP were disclosed on November 7, 2022 on the WB website and the SIDA website. The final Executive Summaries of the ESMF and the Akram Wah ESIA were distributed to the World Bank Board on November 11, 2022. Relevant documents were also disclosed on the Agriculture Department and PCMU website by November 30, 2022. (PCMU: <http://pcmu.gos.pk>; SIDA: <http://sida.org.pk/pages.aspx?id=106> ; Agriculture Department: <https://www.ictagrisindh.gov.pk/>; SBIP: <https://sbip.org.pk/environment-social/>)



for which locations have not yet been confirmed; (iii) Environmental Code of Practices (ECoPs); (iv) Labor Management Procedures; (v) Stakeholder Engagement Plan (SEP); and (vi) institutional arrangements and budget for ESMF implementation. The ESMF also includes the scope of work for the SSWP (subcomponent 1.2) that outlines the general methodology for preparing the Plan, including cumulative impact analysis of water resources management and development on the valued environmental components of Sindh's water-based ecosystem. The Karachi Water and Sewerage Board, which is implementing the Bank-financed KWSSIP, will also participate in the formulation of the Plan, thus allowing for an understanding of Karachi's influence on the cumulative impacts of water use in Sindh. The ESMF has an annex for the FERC, which includes environmental and social screening, mitigation measures, institutional arrangements, and budget.

89. The Akram Wah ESIA includes an ESMP and ECoPs, which will be part of the bidding document for the contractors. The ESMP includes provisions for a Health and Safety Plan as well as managing the influx of outside labor, including managing potential gender-based violence issues. The RPF guides the formulation of RAPs associated with all civil works and feasibility studies in Components 2 and 3 for which locations and technical details are yet not determined. Preparation of RAPs and ESAs for the Right Bank main canal upgrading (subcomponent 2.4) will also be guided by the RPF. The RPF requires the preparation of due diligence reports before formulating any RAPs so the Bank can advise the GoS on how best to proceed on any social legacy issues given the specific circumstances.

90. Akram Wah SMRP. In early 2021, while preparation of SWAT was ongoing, the Sindh High Court mandated that the Irrigation Department undertake an AED for all its property throughout the province, including clearing the RoW of the Akram Wah canal. An estimated 1,246 households were affected, with more than 90 percent experiencing significant impacts. In addition, there are 112 households in the RoW near the end of the canal that were not affected by the AED but will need to shift their structures. Most of the AED-affected households comprise poor, informal settlers who were displaced from their homes. To address these legacy issues, SIDA prepared the SMRP which will: (i) provide replacement of lost assets and opportunity for AED-affected households to improve their standard of living; and (ii) pilot an approach to allowing AED-affected households along the Akram Wah canal back on to the RoW in accordance with the Irrigation Department approach that was announced in mid-2021. The SMRP follows OP4.12 and is consistent with Environmental and Social Standards (ESS) 5. The general provisions of the SMRP include compensation to AED-affected households for lost assets at full replacement cost, as well as transportation, resettlement, and vulnerability allowances. The SMRP provides opportunities for livelihood enhancement through the provision of vocational training, and potential employment in the Akram Wah construction works. The RoWs for most irrigation canals in Sindh province were acquired decades ago when there was limited population pressure and thus are generally wider than required for operational purposes. SIDA will pilot an approach whereby AED-affected households are granted permission to move back into the RoW in a supervised manner. SIDA will ensure that no new encroachments occur on the RoW. The SMRP also covers non-AED related resettlement issues such as resettlement of non-AED-affected households, minor land acquisition outside of the RoW, and removal and replacement of community structures and public infrastructure within the RoW. SIDA has formed a Sindh Panel of Experts to provide guidance on the formulation and implementation of the SMRP. An independent resettlement monitor will be contracted to provide supplemental reporting to the GoS and the Bank. The Akram Wah RoW was not affected by the 2022 floods, and there has been no encroachment on the RoW from flood-displaced people.

Other Safeguards



91. **Dam Safety (OP 4.37).** This policy is triggered because the AWBs use water diverted from three large barrages on the main stem of the Indus (Guddu, Sukkur, and Kotri). The SBIP is supporting the rehabilitation for Guddu and Sukkur Barrages, undertaking a safety inspection of Kotri barrage, and preparing O&M Plans and Emergency Preparation Plans for all three barrages. Under the SWAT Financing Agreement, the Irrigation Department will maintain the obligation to conduct the safety inspection for the Kotri Barrage and implement the O&M plans and Emergency Preparation Plans for all three barrages.

92. **Projects on International Waterways (OP 7.50).** This policy is triggered since the project relies on water from the Indus River, which is an international waterway. Project activities will finance water resources surveys and feasibility studies, and infrastructure works that will be limited to renovation of existing irrigation facilities to improve agriculture water productivity. The activities are not expected to increase water abstraction from the Indus River. Thus, (i) the project will not adversely impact the quantity or quality of water in the international waterway; and (ii) the project investments will not be adversely affected by other riparian possible water use. The project, therefore, falls within the exception to the notification requirements as set forth in Paragraph 7(a) and 7(b) of OP 7.50. The exception to the notification requirement was approved by the South Asia Regional Vice President on October 21, 2022.

D. Corporate Requirements

93. **Citizen Engagement.** Beneficiary feedback will be monitored periodically as part of project M&E surveys and during implementation of the SEP. Since the project will work through multiple community/farmer centric platforms, such as WCAs, FOs and AWBs, citizen engagement will be continuous across the project lifecycle. These same platforms will also be used to measure beneficiaries' feedback on project performance and targeting. The Results Monitoring and Evaluation Framework includes an indicator to assess farmer beneficiaries' satisfaction with each FO subproject. The SSWP also consists of a specific task for preparing and implementing stakeholder engagement and capacity building to ensure citizen engagement throughout the planning process.

94. **Gender.** A GAP has been prepared and is included in the POM and ESMF. The GAP aims to address evidence of traditional exclusion of women from decision-making in formal community organizations in the agriculture and irrigation sector due to sociocultural norms that undermine women's participation in such roles as well as gender inequalities in education and technical skills and in access to land and other agricultural inputs and services. Activities in the GAP will be implemented under relevant subcomponents, and progress will be measured by the appropriate entity following the POM. The progress in improving the participation of female leaders and members in FOs, WCAs, and AWBs, which is in line with a recent amendment to the SWMO, will be monitored by the project's Results Framework. The project will support suitable terms and conditions for women to participate in decision-making processes of FOs and WCAs in terms of timing, meeting arrangements, and election of leaders. This will include separate meetings for women with stipends provided for participation. In addition, training programs on leadership, communication, and technical skills for women in FOs and WCAs will be financed by the project. Finally, community awareness-raising activities will be conducted to highlight the importance of women's knowledge and roles in agriculture and of their participation in decision-making.

95. **Climate Co-benefits.** Component 1 will help Sindh province cope with climate change by improving monitoring systems, utilizing adaptive planning approaches that consider climate uncertainty, and improving resilience to floods and droughts. Component 2 will improve water use efficiency by better matching water supply with demand and reducing losses, thus boosting climate resilience in the face of shifting seasonal water availability and more frequent droughts. Component 3 promotes climate-smart



agriculture to increase sustainable productivity, strengthen farmers' resilience, reduce agriculture's GHG emissions, and increase carbon sequestration. Finally, Component 5 will enable farmers to recover from the extreme flooding of the 2022 floods, which is partially attributable to climate change. A Climate Change Technical Note (P167596) has been prepared, which provides more detailed information.

96. **Stakeholder Engagement.** A SEP has been prepared and included as part of the ESMF identifying affected parties, other interested parties, and vulnerable groups. Each PIU will implement its relevant stakeholder engagement program during project implementation. Under Component 1, the SSWP will involve consultations with various stakeholders, including government agencies, civil society, the research community, and local communities. In addition, the FO subprojects will utilize a community-driven development process whereby the communities prioritize the most appropriate investments. The policy formulation process for the PBCs will include stakeholder consultations, including public hearings. In addition, the Akram Wah SMRP has its dedicated feedback and grievance redress system, which an independent resettlement monitoring consultant is also monitoring.

V. GRIEVANCE REDRESS SERVICES

97. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit www.worldbank.org/grs. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

VI. KEY RISKS

98. **The overall risk of the project is rated High.** The rating is based on the high risks associated with sector policies and environmental and social aspects.³⁸ The main risks and mitigation measures are described below

99. **Political and Governance risk is Substantial.** The GoS demonstrates strong interest in the project, particularly in the context of the flood emergency in many parts of the country. While the interventions supported by this project are expected to remain a priority, the impetus for broader and deeper policy reforms and decision making may slow down particularly in the run up to the next general elections. Post floods, regular meetings to support the delivery of projects in Sindh are chaired by the Chief Minister, Sindh, with representation by relevant departments and the World Bank. The project will ensure that PDD is regularly informed of project monitoring and performance and will help steer implementation.

100. **Macroeconomic risk is High.** The recent floods have adversely impacted Pakistan's economic outlook and may delay implementation of overdue policy adjustment. Significant risks include potential worsening of external conditions, further natural disasters, and a slowdown or reversals in policy

³⁸ World Bank. May 11, 2020. "Guiding Principles in Risk Assessment and the Application of the Systematic Operations Risk-Rating Tool (SORT) in World Bank Operations." World Bank, Washington, D.C.



adjustment in the lead-up to elections. Realization of these risks may lead to macroeconomic instability, with major impacts on economic activities, prices, and household incomes, thereby impeding achievement of project results. These risks are partly mitigated by the ongoing World Bank support to structural policy reforms in the fiscal and power sector areas, as well as the International Monetary Fund Extended Fund Facility program which supports sound economic and fiscal management and other critical structural reforms. At the project level, it is expected that the GoS will prioritize SWAT in allocating government financing given its potential to transform agricultural water productivity and support rehabilitation and livelihoods.

101. **Sector Strategies and Policies risk is High.** Fundamental changes in existing water and agricultural policies, laws, and regulations are built into the project design through the PBCs. However, this will not be easy as some interest groups always lose, or perceive that they lose, from the reform process and may stand in opposition. The reform principles are embedded in the 2018 Agricultural Policy and the forthcoming Sindh Water Policy, which helps mitigate some risks. Nevertheless, the risks accompanying the adoption of concrete action in the PBC reform areas are considered high.

102. **Technical Design risk is Substantial.** Most project investments are technically straightforward, including standard civil works such as canal upgrading or applying well-proven climate-smart agricultural practices. Some activities, however, are novel and require a high level of technical expertise, including formulation of the SSWP, start-up of the HAI program, introducing of irrigation modernization, and supporting the wheat reform process. Project-financed technical assistance partly addresses these challenges, but the overall technical risk is still substantial.

103. **Institutional Capacity for Implementation and Sustainability risk is Substantial.** The project will require unprecedented levels of collaboration between the Irrigation Department, including SIDA, and the Agriculture Department. The collaboration will be facilitated by the PCMU, which has been placed in the PDD to provide overall project management and coordination. SIDA and the Agriculture Department have recently executed Bank-financed projects and have sufficient implementation capacity. Technical assistance will be provided to help build the capacity of these organizations, but the risk is still considered substantial.

104. **Environment and Social risk is High.** The implementation of the Akram Wah subproject will be complex and entails significant social and environmental risks and impacts. Implementation of the SMRP involves many poor households that were displaced almost two years ago, piloting a new approach to allow them back on the RoW. These risks will be partially mitigated through independent third-party monitoring and a Sindh Panel of Experts to help guide implementation.

**VII. RESULTS FRAMEWORK AND MONITORING****Results Framework****COUNTRY:** Pakistan**Sindh Water and Agriculture Transformation Project (SWAT)****Project Development Objectives(s)**

To increase agricultural water productivity in Selected Farmers' Organization command areas, improve integrated water resources management, and contribute to restoring crop production by small and medium-sized farmers affected by the 2022 floods.

Project Development Objective Indicators

Indicator Name	PBC	Baseline	End Target
Increased agricultural water productivity in targeted FO command areas			
FO subprojects in which agricultural surface water productivity increases by at least 20 percent (Number)		0.00	12.00
Acres of water thrifty crops supported through the smart subsidy scheme (Number)		0.00	80,000.00
Improved institutional framework for water resources management in Sindh province			
FO subprojects where the AWB delivers the agreed upon water volumes in compliance with FO-AWB Water Service agreements (Number)		0.00	12.00
Sindh Strategic Water Plan approved by the Sindh Water Resources Commission (Yes/No)		No	Yes
Facilitate the recovery of small farmers from the 2022 floods			
Farmers who receive cash transfers and resume agricultural production in 2023 (Number)		0.00	800,000.00

**Intermediate Results Indicators by Components**

Indicator Name	PBC	Baseline	End Target
Water Resources Management			
Draft water bill submitted to Sindh Provincial Assembly by the Sindh Law and Parliamentary Affairs Department (Yes/No)	PBC 1	No	Yes
Irrigation Department Transformed into Irrigation and Water Resources Department (Yes/No)		No	Yes
Functional Hydro-Agro Informatics Program established (Yes/No)		No	Yes
Water Service Delivery			
Water pricing reform study completed and Abiana rates increased by the Sindh Irrigation Department (Yes/No)	PBC 2	No	Yes
Preparation studies for Right Bank investments completed (Yes/No)		No	Yes
Akram Wah Canal physical works completed (Percentage)		0.00	100.00
Groundwater actively managed in conjunction with surface water supplies in at least 2 pilot FOs (Yes/No)		No	Yes
Targeted Agricultural Incentives and Investment			
Sindh Food Department Wheat Strategic Reserve Monitoring System functional (Yes/No)	PBC 3	No	Yes
New policy on Sindh agriculture research and extension adopted by the Sindh Cabinet (Yes/No)	PBC 4	No	Yes
Sindh Crop and Market Monitoring System Improved (Yes/No)		No	Yes
Waterlogging and Salinity management capacity strengthened (Yes/No)		No	Yes
Acres of applied research activities (Number)		0.00	520.00
Labs rehabilitated (Number)		0.00	6.00



Indicator Name	PBC	Baseline	End Target
Farmers and agricultural small and medium enterprises supported to enhance value chain for high value water thrifty crops (Number)	0.00		2,100.00
Farmers trained (Number)	0.00		80,000.00
of which female (Number)	0.00		10,500.00
Agriculture Extension offices rehabilitated (Number)	0.00		15.00
Cross-Cutting			
Acres supported with improved on-farm water management measures (Number)	0.00		110,000.00
Farmers satisfied with development/implementation of Area Development Plan (Percentage)	0.00		70.00
Representation of women in leadership increased in agriculture and water resources management organizations (Yes/No)	No		Yes
Target FOs with at least two women on the board (Percentage)	0.00		80.00
Target WCAs with at least two women on the board (Percentage)	0.00		80.00
Target AWBs with at least two women on the board (Percentage)	0.00		100.00



Monitoring & Evaluation Plan: PDO Indicators					
Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
FO subprojects in which agricultural surface water productivity increases by at least 20 percent	Subproject assessment reports will evaluate the change in agricultural surface water productivity (crop revenue divided by total volume of surface water supplied in PKR/m ³) attributable to the project.	Annual	Agricultural Water Productivity reports prepared by the HAI center	HAI center collects data, performs analysis, prepares final subproject assessment report	HAI center
Acres of water thrifty crops supported through the smart subsidy scheme	The smart subsidy program design will specify the procedure for tracking and criteria for inclusion in the program.	Annual	program records, crop reporting services	ADU collects data from Smart Subsidy Scheme and crop recording services	ADU
FO subprojects where the AWB delivers the agreed upon water volumes in compliance with FO-AWB Water Service agreements	SIDA will evaluate AWB compliance with the AWB-FO service agreement.	Annual	Service Agreements, flow records	SIDA collects information and evaluates compliance	SIDA
Sindh Strategic Water Plan approved by the Sindh Water Resources Commission	The Plan is approved by the Sindh Water Resources Commission.	Annual	Sindh Water Commission Approval	PCMU liason with Sindh Water Commission	PCMU
Farmers who receive cash transfers and resume agricultural production in 2023	Farmers affected by the 2022 floods will receive cash transfers in line with the FERC manual.	Once	Cash transfer MIS, post-distribution sample surveys	Recipient data will be collected via MIS; surveys will estimate fraction of recipients who resumed production	ADU

**Monitoring & Evaluation Plan: Intermediate Results Indicators**

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Draft water bill submitted to Sindh Provincial Assembly by the Sindh Law and Parliamentary Affairs Department	The Sindh Law and Parliamentary Affairs Department submits a draft water resources bill for consideration by the Sindh Provincial Assembly that replaces the Irrigation Act (1879) and the Sindh Water Management Ordinance (2002) to create a unified legal framework for IWRM and irrigation services.	Annual	Provincial Assembly Records	Copy of draft law submission	PCMU
Irrigation Department Transformed into Irrigation and Water Resources Department	Transformation will be indicated by successful implementation of the transformation plan.	Annual	PCMU evaluation	PCMU liaison with Irrigation Department	PCMU
Functional Hydro-Agro Informatics Program established	An operational program will offer the following three core services: (i) Flow and Irrigation Service Monitoring Reports, (ii) Crop Monitoring Reports and (iii) Agricultural Water Productivity Reports.	Annual	HAI annual report	HAI annual report will summarize milestones and data products	PCMU
Water pricing reform study completed and Abiana rates increased by the Sindh Irrigation Department	The Sindh Irrigation Department undertakes a water pricing reform study,	Annual	Irrigation Department Regulations	Copy of promulgation obtained	SIDA



	and increases Abiana rates after due consideration of study recommendations.				
Preparation studies for Right Bank investments completed	SIDA prepares engineering design studies at level sufficient for tendering along with ESIA and RAP/CAPs for the renovation of the Rice, Dadu, and Northwest Canals in line with WB Policy requirements 4.01 and 4.12 and the project's RPF.	Annual	Completed Studies	Track number of studies completed	SIDA
Akram Wah Canal physical works completed	Percent of physical works completion measured by contract payments.	Quarterly	Construction Reports	Construction Progress Monitored by SIDA	SIDA
Groundwater actively managed in conjunction with surface water supplies in at least 2 pilot FOs	A conjunctive management plan will be developed by pilot FOs based on data from the HAI program. SIDA will evaluate the if the plan is actively implemented and provide a final public report on lessons learned for each pilot.	Annual	Instruments procurement records, HAI water balances, AWB and FO planning documents and service agreements, farmer surveys	SIDA collect information and evaluates pilots	SIDA
Sindh Food Department Wheat Strategic Reserve Monitoring System functional	The SFD puts in place a wheat market monitoring system to increase	Annual	SFD	PCMU collects data from SFD	PCMU



	transparency and predictability, and publishes an annual report based on said system for at least two years in a row.				
New policy on Sindh agriculture research and extension adopted by the Sindh Cabinet	The Sindh Cabinet adopts a program that: (i) increases the provincial budget for agriculture and livestock research as a percentage of Sindh agriculture GDP; and (ii) establishes an autonomous SARB with representatives from government, academia, private sector, and farmers to plan, allocate funds, and monitor the provincial R&E system.	Annual	Sindh Cabinet Promulgations	ADU monitors promulgations	ADU
Sindh Crop and Market Monitoring System Improved	The PMC shall evaluate implementation of crop reporting and price monitoring action plans to be prepared under the project.	Mid-term and End of Project	Evaluation reports using 5 point scale	ADU will collect evaluation reports	ADU
Waterlogging and Salinity management capacity strengthened	The project will support applied research activities and rehabilitation of water logging and research labs .	Annual	Grant records; construction records	ADU to monitor program implementation	ADU
Acres of applied research activities	The research projects must represent the typologies	Annual	Grant records	ADU to monitor implementation	ADU



	and issues identified in the research agenda to be prepared during the first year and must be distributed amongst the project areas, including each of the three AWBs.				
Labs rehabilitated	See parent indicator	Annual	Rehabilitation records	ADU to monitor implementation	ADU
Farmers and agricultural small and medium enterprises supported to enhance value chain for high value water thrifty crops	Small- and medium-sized farmers and agribusinesses will be supported through grants with preference given to those located in FO subprojects.	Annual	Directorate of agricultural extension	grant records	ADU
Farmers trained	The project will provide training to male and female farmers in climate smart agriculture, value chain development, and waterlogged and salinity management.	annual	Training records	Training attendance reported to ADU via MIS	ADU
of which female	see parent indicator	see parent indicator	see parent indicator	see parent indicator	see parent indicator
Agriculture Extension offices rehabilitated	Rehabilitate facilities/ offices must be critical to the project and affected by the 2022 floods.	Annual	Construction Records	ADU to monitor construction	ADU
Acres supported with improved on-farm water management measures	All land in a WCA is counted if: (i) flows are recorded at	Annual	FO flow monitoring	ADU and SIDA monitor	ADU and SIDA



	the corresponding FO's command area inlet (ii) flows are recorded at each WCA inlet in the FO and (iii) at least 50 percent of the WCA area has on-farm water management improvements.		records; on-farm water management improvement records		
Farmers satisfied with development/implementation of Area Development Plan	Independent surveys will assess farmer satisfaction (disaggregated by gender) with the development or implementation of the FO Area Development Plan.	Annual	Farmer surveys	PCMU through survey firm collects information and evaluates compliance	PCMU
Representation of women in leadership increased in agriculture and water resources management organizations	Women's leadership positions will be in compliance with the SWMO amendment 2021.	Annual	FO, WCA, AWB and SIDA Board membership records	This indicator will be monitored as part of the Gender Action Plan in the ESMF	PCMU
Target FOs with at least two women on the board	Two of seven board positions held by women.	see parent indicator	see parent indicator	see parent indicator	see parent indicator
Target WCAs with at least two women on the board	Two of five board positions held by women.	see parent indicator	see parent indicator	see parent indicator	see parent indicator
Target AWBs with at least two women on the board	Two of fourteen board positions held by women.	see parent indicator	see parent indicator	see parent indicator	



Performance-Based Conditions Matrix

PBC 1	New Water Bill			
Type of PBC	Scalability	Unit of Measure	Total Allocated Amount (USD)	As % of Total Financing Amount
Process	No	Yes/No	5,000,000.00	1.71
Period	Value		Allocated Amount (USD)	Formula
Baseline	No			
End Target Date	Yes		5,000,000.00	at submission
PBC 2	Water Pricing Reform			
Type of PBC	Scalability	Unit of Measure	Total Allocated Amount (USD)	As % of Total Financing Amount
Output	No	Yes/No	5,000,000.00	1.71
Period	Value		Allocated Amount (USD)	Formula
Baseline	No			
End Target Date	Yes		5,000,000.00	at promulgation
PBC 3	Wheat Strategic Reserve Monitoring			
Type of PBC	Scalability	Unit of Measure	Total Allocated Amount (USD)	As % of Total Financing Amount
Intermediate Outcome	No	Yes/No	5,000,000.00	1.71
Period	Value		Allocated Amount (USD)	Formula
Baseline	No			



End Target Date	Yes		5,000,000.00	upon reaching target amount
PBC 4	New Policy on Agriculture R&E			
Type of PBC	Scalability	Unit of Measure	Total Allocated Amount (USD)	As % of Total Financing Amount
Output	No	Yes/No	5,000,000.00	1.71
Period	Value		Allocated Amount (USD)	Formula
Baseline	No			
End Target Date	Yes		5,000,000.00	at policy adoption

Verification Protocol Table: Performance-Based Conditions

PBC 1	New Water Bill
Description	The Sindh Law and Parliamentary Affairs Department submits a draft water resources bill for consideration by the Sindh Provincial Assembly that replaces the Irrigation Act (1879) and the Sindh Water Management Ordinance (2002) to create a unified legal framework for IWRM and irrigation services.
Data source/ Agency	See indicator description
Verification Entity	PCMU
Procedure	PCMU obtains copy of bill submission
PBC 2	Water Pricing Reform
Description	The Sindh Irrigation Department undertakes a water pricing reform study and increases Abiana rates after due consideration of the study recommendations.



Data source/ Agency	SIDA
Verification Entity	PCMU
Procedure	PCMU obtains copy of Abiana promulgation
PBC 3	Wheat Strategic Reserve Monitoring
Description	The Sindh Food Department puts in place a wheat market monitoring system to increase transparency and predictability, and publishes an annual report based on said system for at least two years in a row.
Data source/ Agency	Sindh Food Department
Verification Entity	PCMU
Procedure	PCMU verifies publication of annual report
PBC 4	New Policy on Agriculture R&E
Description	The Sindh Cabinet adopts a program that: (i) increases the provincial budget for agriculture and livestock research as a percentage of Sindh agriculture GDP; and (ii) establishes an autonomous SARB with representatives from government, academia, private sector, and farmers to plan, allocate funds, and monitor the provincial R&E system.
Data source/ Agency	Sindh Cabinet Promulgations
Verification Entity	PCMU
Procedure	PCMU obtains proof of promulgation



ANNEX 1: Implementation Arrangements and Project Costs

Implementation Arrangements

1. There are three PIUs, which are each attached to a government department that provides government staffing and budget (see Table A1.1). Each PIU is responsible for all aspects of project management for its respective component, including procurement and contract management, FM, safeguards, and M&E, under the overall supervision of the PCMU. As noted below, each PIU must work with other entities outside of its parent department to achieve the development objectives. The following paragraphs provide more information on each PIU.

Table A1.1. Departments, PIUs, and Partner Entities for SWAT Components

Component	Parent Department	PIU	Partner Entities
1. Water Resources Management	PDD	PCMU	--Irrigation Department --Agriculture Department --Environment Department --Disaster Management Authority --Civil Society and Research Institutes
2. Water Service Delivery	Irrigation Department	SIDA	--Agriculture Department --AWBs --FOS --WCAs --Farmers
3. Targeted Agricultural Incentives and Investments	Agriculture Department	ADU	--SIDA --SFD --Agriculture Dept Directorates: Research, Extension, Water Management, and Planning and Monitoring --Farmers and Agri-business
4. Project Coordination and Monitoring	PDD	PCMU	--All of the above
5. Agricultural Flood Emergency Rehabilitation	Agriculture Department	ADU	--Agriculture Department Extension Directorate --Rural Support Organizations (NGOs)

2. **SIDA** was established by the SWMO in 2002. Per this ordinance, SIDA was mandated to take over the management of the three Indus River barrages and supply water to the AWB, as well as managing the main outfall drains. However, in practice no operational role was transferred to SIDA by the Irrigation Department; rather SIDA became the agency responsible for the implementation of WSIP and for supporting the establishment of FOs. The budget allocated to the three AWBs is channeled through the authority of SIDA's Managing Director. It is expected that the formal mandate of SIDA will be adjusted during the project through promulgation of a new Water Law to better reflect its current functions.

3. **SIDA** served as the project implementing unit under the WSIP and is a well-established organization under the Irrigation Department with headquarters in Hyderabad. It has several well-staffed and capable units, including: (i) transition unit to support participatory irrigation management; (ii) operations unit in charge of procurement, engineering, geographic information systems, and IT; (iii) environmental management unit; and (iv) administrative and financial unit. SIDA receives its budget from the Irrigation Department. The Component 2 project director position should be competitively selected through a process open to the market, including to Irrigation Department staff.



4. **The ADU** is a new cross-disciplinary unit that was formally established in the Agriculture Department under the direct supervision of the Secretary/Additional Secretary. The Agriculture Department has extensive experience implementing WB-financed project, and staff for the two ongoing projects, SAGP and SIAPEP, will be transferred to the ADU. The ADU has two broad mandates. First to serve as the PIU for the SWAT project responsible for all procurement, FM, safeguards, and monitoring under Component 3. Since this component includes the participation of different directorates within the Agriculture Department, the ADU will ensure coordination between these entities as well as coordination with SIDA (Component 2) and PCMU (Component 1) as required. The second mandate of the ADU is to provide technical assistance for achieving the agriculture-related PBCs. The capacity of the ADU will be strengthened through the contracting of PISCs and individual consultants. It is expected that the ADU will become a permanent entity that will facilitate policy formulation and implementation within the Agriculture Department. The ADU project director should be competitively selected through a process open to the market, including to Agriculture Department staff.

5. **The PCMU** has been in existence since 1985 and is a special unit within the PDD. It has the responsibility of facilitating and streamlining foreign aided projects. The PCMU is responsible for implementation support, M&E of projects, and ensuring coordination between donor agencies and government departments. The PCMU has facilitated a number of WB-financed projects including the Karachi Special Development Project (1985–97), the National Drainage Program (1998–2006); WSIP (2007–2020), and the ongoing SBIP. The PCMU has been mandated to lead the coordination of SWAT and currently utilizes SBIP funding for this purpose. The PCMU is headed by a Project Coordinator and includes three Directors: Water, Agriculture, and Monitoring and Evaluation. The PCMU will be suitably strengthened under the project with support from a PISC consulting firm, technical support from the FAO, and individual consultants. The Project Coordinator position should be competitively selected.

6. There are two higher level SWAT committees. The **Project Technical Committee** is composed of high-level representatives from the Irrigation Department, SIDA, Agriculture Department, and the PCMU. The **Project Steering Committee** will be formally established when the loan becomes effective and will be chaired by the PDD Chairperson and include the Secretaries of Irrigation, Agriculture and Finance. The Steering Committee will report directly to the Sindh Chief Minister.

Financial Management Arrangements

7. An FM assessment has been undertaken by the Bank and the results are summarized below.

8. **Staffing:** All PIUs have sufficient, dedicated FM capacity to handle project tasks effectively. The PCMU will have dedicated FM staff either hired or seconded by the Office of the Auditor General of Pakistan according to terms of reference acceptable to the WB. SIDA and the ADU have FM staff and existing FM systems set up for WB projects.

9. **Budgeting and planning:** SIDA and the ADU will prepare their respective annual budgets based on their work plans and submit it to the PCMU, which will then consolidate and send them to the WB at least one month before the beginning of the project's fiscal year for review and approval. The project budget will follow applicable government/entity budgeting guidelines, which will be set out in the POM. Budget for the project will be a part of the GoS's Development Budget. Payments to the farmers will be provided using the latest technological platform involving mobile banking. This activity will be managed under the DA established for the ADU. The operationalization of smart subsidies under subcomponent 3.2 will not lead to parking of government funds outside of the Treasury Single Account (meaning no advance payments will be made for subsequent disbursement) and will be used to provide benefits to the farmers



based on pre-determined criteria. Transaction trail of each subsidy payment will remain visible.

10. **Accounting:** The PIUs shall maintain on cash basis separate books of accounts (i.e., cash book, ledgers, bank reconciliations, cheque register, invoice register, commitment register, fixed asset register, and inventory/stock register). Common financial accounting software will be used for transparency, accuracy, and effective reports generation. The project will use the Chart of Accounts under the NAM being used in the GoS. The project's annual financial statements will be prepared in accordance with the International Public Sector Accounting Standards cash basis of accounting.

11. **Internal controls:** Relevant government rules and regulations include Financial Rules and Accounting Policies and Procedures Manual, which include budget checks, a well-defined and segregated scheme of assignments, delegation of financial power rules delineating the categories of officers and expenditure-sanctioning competencies, and custody of assets. The project's expenditure will be incurred by the PIUs in accordance with these internal controls (except for procurements wherein the WB's Procurement Regulations will be followed). For safeguarding of assets and stocks/inventory procured under the project, separate fixed asset register along with inventory/stock register shall be maintained as per the agreed formats. These will be tagged for identification and subjected to a regular physical verification and audit. The FM staff will conduct regular reconciliation with the government's Financial Management Information System (SAP R/3) as per the Revised Revolving Fund Assignment Account Rules 2022. The existing internal audit setup at the department level should ensure that proper internal controls are in place to validate the funds issued by the WB are used for intended purposes.

12. **Internal audit** will be an ongoing activity to be conducted by an internal audit firm hired from the market through a standard procurement process. The firm should have experience of handling WB-funded projects. A chartered accounting firm will conduct the project audit twice a year and present its report separately for each component. The firm shall focus on the subsidy's component and provide coverage to the amounts distributed to the farmers and provide its analysis on the effectiveness of process.

13. **Reporting:** The project shall prepare and submit semiannual IUFRRs to the WB within 45 days after the end of each six months. Further, the project shall prepare and submit to the external auditors, within two months after the end of the fiscal year, annual financial statements. The audited financial statements for each component will be shared with the WB no later than six months after the end of the fiscal year.

14. **Designated accounts:** There are three DAs, one for each PIU: PCMU, SIDA, and ADU. Project funds will be disbursed into each segregated DA to be opened and maintained at the National Bank of Pakistan. Withdrawal Applications will be submitted to the Bank, supported by a six-monthly cash flow forecast and IUFRRs. The project follows all IPF procedures and disburses only against eligible expenditures. In addition, for a predefined set of these eligible expenditures, the GoS must also meet the associated PBC for the expenditures to be eligible for Bank financing.

15. **Agricultural FERC:** FM for the cash transfers to small farmers will be laid out in the FERC Manual. To ensure that only targeted farmers are receiving these cash transfers, the project will be implementing a cash transfer mechanism system by: (i) establishing an Management Information System (MIS) system containing a database of targeted beneficiaries; and (ii) bringing onboard a mobile money transfer company that will transfer the funds using the MIS system, potentially with additional biometric verification checks.

16. **Financing and disbursement categories:** Two sources of IDA financing will be utilized for the project: National PBAs and SUW. The financing sources, disbursement categories, and disbursement



conditions are specified in the Financing Agreement.

17. **PBCs:** There are four PBCs, each with an associated amount of US\$5 million, attached to the first disbursement category. The total amount of WB financing for eligible expenses for this category is conditional upon the number of PBCs achieved as shown in Table A1.2. The status of each PBC will be included in every semi-annual project report, every interim financial report submitted for disbursement, and also noted in annual audit reports. Achievement of a PBC is dependent upon verification by the PCMU and written acceptance by the WB team leader. Advances over the applicable financing limit are allowable, but in the event the PBC(s) are not achieved then it will be necessary to refund the funds.

Table A1.2. Financing Limits by PBC

Number of PBCs Achieved	4 PBCs	3 PBCs	2 PBCs	1 PBC	0 PBCs
WB Financing Limits (US\$ million)	177.2	172.2	167.2	162.2	157.2

18. **External audit:** The project will engage Director General Audit Sindh who is the representative of the Office of the Auditor General of Pakistan for the annual audit. Acceptable audited financial statements along with auditor's report thereon and auditor's management letter reporting control weaknesses must be submitted within six months of the close of the fiscal year.

19. **Summary of Project Costs:** Table A1.3 shows the US dollar equivalents as of November 1, 2022, of the project costs in the approved PC-1 (i.e., GOP's project approval document).

Table A1.3. Component Costs (US\$ Millions)

	WB	GoS	Total
1. Water Resources Management			
1.1 Policy and Institutional Reforms	2.1	0	2.1
1.2 SSWP	3.7	0	3.7
1.3 HAI Program	9.2	2	11.2
Sub-Total	15	2	17
2. Water Service Delivery			
2.1 Integrated FO Area Development	16.1	1	17.1
2.2 FO, AWB and SIDA Support	11.64	3.36	15
2.3 Left Bank Main Canals	85.15	7.85	93
2.4 Right Bank Preparatory Studies	2.65	0.35	3
Subtotal	115.54	12.56	128.1
3. Targeted Agricultural Incentives and Investments			
3.1 Integrated FO Area Development	15.0	1.0	16.0
3.2 Smart Subsidies	16.8	3.0	19.8
3.3 Agriculture Information and Technology	6.0	2.6	8.7
3.4 Agriculture Value Chain	15.1	2.2	17.3
3.5 ADU Support	2.3	1.6	3.9
Sub-Total	55.1	10.4	65.5
4. Project Coordination and Monitoring			
4.1 Project Management Consultants	1.6	1.0	2.6



4.2 FAO Technical Assistance	2.1	0.0	2.1
4.4 Wheat Procurement Reform Support	1.9	0.0	1.9
4.5 Training, National and International Linkages	1.0	0.0	1.0
4.6 Incremental Operating Costs	1.7	2.0	3.7
Subtotal	8.3	3.0	11.4
5. Agricultural Flood Emergency Rehabilitation	98.0	0.0	98.0
6. Contingent Emergency Response Component	0	0	0
TOTAL	292.0	28.0	320.0

Procurement Arrangements

20. Each PIU will be responsible for procurement under its respective component. The PCMU and SIDA have a track record of implementing Bank-funded projects that involve large infrastructure contracts and consultancies. ADU procurement staff can be drawn from experienced staff that worked on SAGP and SIAPPEP. The PMC will also assist in procurement and contract management. Project implementation support personnel contracted to carry out routine tasks under the guidance of project management and technical specialists are not treated as individual consultants in accordance with Paragraph 7.32 of the Procurement Regulations. These are selected according to the hiring procedures of the GoS and reviewed and agreed by the Bank.

21. Component 1 includes two large consultancies procured through international open competition using quality cost-based selection (QCBS) procedures: (i) a consultancy for the preparation of the SSWP; and (ii) a consultancy for technical assistance to start up the HAI Program. SIDA may also most likely contract the Pakistan Center for Advanced Studies in Water (PCAS-W) at the Mehran University of Engineering and Technology in Jamshoro on a sole source basis to support the HAI Center. The PCAS-W is an established educational and applied research center dedicated to resolving Pakistan's water crises through applied research, academia-industry collaboration, and policy formulation and thus meets the requirements of Paragraph 3.23 (c) of the Procurement Regulations. Component 1 also includes the procurement of goods, small works, and non-consulting services, which will be procured through national competition using either request for bids or request for quotations depending on the estimated value.

22. Component 2 includes a large civil works package for the renovation of Akram Wah canal (estimated cost of US\$83 million), which will be procured through international open competition using a request for bids. In order for national bidders to be qualified to enhance competition, the construction is divided into multiple lots. SIDA will procure a PIC for the Akram Wah subproject through international open competition using QCBS procedures. For the FO subprojects under Component 2, the detailed implementation procedures, including procurement, are described in the FO Subproject Manual. SIDA will procure a large consulting contract for the FO subproject implementation support consultancy through international open competition using QCBS. There will be some small works contracts for the estimated 15 FO subprojects that will be procured from the national market using request for bids or request for quotations, depending on the estimated value. In addition, SIDA will procure high value consultancy services for the Right Bank feasibility study, EISAs, and RAPs through international open competition using QCBS procedures.

23. Component 3 will utilize a variety of specialized procurement processes. For subcomponent 3.1 (agriculture FO subprojects) and subcomponent 3.4 (value chain development), the ADU will



competitively pre-screen prospective suppliers on a defined eligibility and qualification criteria to provide pre-defined items such as watercourse canal sections, laser land leveling, high-efficiency irrigation systems, storage sheds, refrigeration facilities, etc. The suppliers will then provide the equipment to farmers, WCAs, and agri-business on a demand basis and at pre-set costs. This approach was used successfully in SIAPEP and SAGP. The details will be provided in the POM along with samples of tripartite agreements between beneficiaries, suppliers, and the ADU. The ADU will also procure a high value PIC through international competition to support all aspects of Component 3.

24. Non-procurable items in Component 3 include smart subsidy payments (subcomponent 3.2). The smart subsidy approach would entail use of an e-voucher system and direct income support through the digital and conventional banking system. An MIS firm may be engaged to establish an elementary MIS system to enable these digital initiatives. Digital payment providers will not be contracted, and this activity will be covered as bank charges to be paid as Incremental Operating Cost. Some rural support organization may also be selected competitively from the national market under a non-consulting method as implementation support monitor for supporting these investments.

25. For Component 4, the PCMU will procure a SWAT PMC that provides overall project implementation support—spanning procurement, FM, safeguards, and technical assistance—through international open competition using QCBS. The FAO will preferably be selected on a sole source basis, utilizing a standard umbrella agreement, to provide specialized technical assistance to all three components.

26. Procurements for Component 5 that are eligible under OP/BP 10.00 Paragraph 12, IPF Policy, will use streamlined procurement methods and arrangements, including unlimited threshold of request for quotation for goods, works, and non-consulting services; using consultants' qualifications for consulting services; reduced bid preparation period; suspension of standstill period; use of Bid Securing Declaration rather than bid security; up to 40 percent advance payment against unconditional bank guarantee; using UN agencies (such as the UN High Commissioner for Refugees, the UN Children's Fund, the World Food Programme, the UN Office for Project Services); waiver for performance security in the case of small contracts for works or supply of goods, etc. Based on these streamlined procurement methods and arrangements, the most appropriate procurement arrangement will be designed, when available, and included into the procurement plan for the approval by the Bank. A brief explanation on the agreed procurement method and market approach shall be recorded.

27. **Project readiness:** An 18-month procurement plan has been prepared, which includes approximately US\$100 million in activities. This includes the Akram Wah works package and the following large consultancies: SWAT PMC, Akram Wah PIC, ADU PIC, and FO subproject implementation support consultancy. The procurement of these activities has commenced utilizing advance procurement procedures and contracts are anticipated to be signed in 2023.

28. **Procurement risk and mitigation:** The key procurement related risks include: (i) frequent turnover of procurement staff; (ii) prospective: consultants/suppliers/contractor/service providers lack skill in managing environmental, social, health, and safety risks; (iii) inadequate capacity of various audit entities to understand the procurement requirements and identify deviations and violations that are not referenced to correct legal requirement; (iv) complex procurements; and (v) public procurement in the province is prone to fraud and corruption risk as duly documented by the National Accountability Bureau and Transparency International.

29. To mitigate these risks, the following measures have been agreed with the project



implementation agencies: (i) notice period of resignation of project staff can be increased to three months; (ii) inclusion of qualification requirements for necessary experience with environment, social, health, and safety management into procurement documents, and familiarization of prospective consultants and bidders in pre-proposal conference and pre-bid meetings about environmental, social, health, and safety risks; (iii) there will be Joint Procurement Clinics with the decision-making staff of the PIUs; and (iv) risks related to high-value contracts will be mitigated through: (a) information and outreach session after publication of request for expressions of interest/pre-qualification/initial selection notices; (b) flexibility in defining specifications and allowing equivalent/better goods to be offered; and (c) investment in skills development and training.

30. For the fraud and corruption risks, the following measures will be instituted: (i) procurement clinics with focus on detecting red flags; (ii) mandatory training of relevant fiduciary staff on Bank's procurement and contract administration; (iii) selection of procurement specialist, FM specialist, and contract management specialist (if required) will be subject to prior review; (iv) for large value and complex procurements, market outreach shall be undertaken; (v) every procurement publication will have a link to the applicable complaint/grievance redress portal; (vi) for enhanced transparency, the pre-bid/pre-proposal conferences, technical proposal submission meeting, financial proposals, bid opening meetings shall be video recorded and proceedings uploaded; (vii) minutes of bid opening, technical proposal submission, and financial proposal opening shall be uploaded on the project's website on a real time basis; (viii) detailed guidance will be provided in the POM regarding conflict of interest, transparency measures, etc.; (ix) the POM will have procedures for to account for willful deviations from procurement processes; (x) monitoring of critical civil works stages will be done through drone cameras that will upload the images on relevant websites; (xi) assessment of indicators of fraud and corruption and Integrity Vice Presidency's Red Flags during Implementation Support Missions; (xii) information on beneficial ownership shall be solicited; (xiii) conflict of interest undertaking by every relevant PIU staff ; and (xiii) internal audit will be independent of the PIUs

31. **Oversight and monitoring:** The Bank team will conduct annual (or ad hoc as needed) procurement post review in addition to prior review as required in the procurement plan and regular implementation support missions. External oversight is performed by Auditor General of Pakistan, Competition Commission, Federal Investigation Agency, National Accountability Bureau, Public Accounts Committee, Public Procurement and Regulatory Authority. These entities have a national and subnational mandate and get directly and indirectly associated with various stages of procurement and contract management. Internally, each entity is required to follow delegation of financial powers whereby procurement transaction from planning, bidding, award, and payments follow a defined hierarchy culminating at principal accounting officer (head of the implementing entity). These mechanisms ensure an adequate internal and external oversight of procurement that provides timely and regular feedback, for example through procurement audits and reviews.

32. **World Bank Implementation Support Plan:** There will always be at least two task team leaders, one from the water practice and one from the agriculture practice. The task team will include procurement, FM, environmental, and social specialists to ensure compliance with WB fiduciary and safeguard standards. At least three formal supervision missions will be conducted every year, with a mid-term review scheduled in Year 3 at the latest. The project will be resourced with an above-average bank budget allocation to support multisectoral supervision activities. Additional Bank-executed trust fund support and alliances with other development partners will be explored as a mechanism to boost the Bank team's ability to provide support to the client.