



Project Information Document (PID)

Concept Stage | Date Prepared/Updated: 23-Jun-2022 | Report No: PIDC32058

**BASIC INFORMATION****A. Basic Project Data**

Country Pakistan	Project ID P176743	Parent Project ID (if any)	Project Name Improving Water Management and Irrigation Systems in Punjab (P176743)
Region SOUTH ASIA	Estimated Appraisal Date Jan 09, 2023	Estimated Board Date Mar 15, 2023	Practice Area (Lead) Water
Financing Instrument Investment Project Financing	Borrower(s) Islamic Republic of Pakistan	Implementing Agency Punjab Irrigation Department, Punjab Planning and Development Board	

Proposed Development Objective(s)

To improve the irrigation service and establish a functional system for conjunctive management of surface and groundwater in selected areas of Punjab.

PROJECT FINANCING DATA (US\$, Millions)**SUMMARY**

Total Project Cost	110.00
Total Financing	110.00
of which IBRD/IDA	100.00
Financing Gap	0.00

DETAILS**World Bank Group Financing**

International Development Association (IDA)	100.00
IDA Credit	100.00

Non-World Bank Group Financing

Counterpart Funding	10.00
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Borrower/Recipient	10.00
Environmental and Social Risk Classification Moderate	Concept Review Decision Track II-The review did authorize the preparation to continue

B. Introduction and Context

Country Context

- 1. Pakistan has made significant progress over the last two decades towards reducing poverty.** The 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. Nonetheless, challenges for inclusive growth remain, systematically related to spatial disparities and deficits in human capital endowment, and access to services and opportunities. Human capital outcomes are poor and stagnant, with high levels of stunting at 38 percent and learning poverty at 75 percent. Growth of per capita gross domestic product (GDP) has also been low, averaging only around 2.1 percent annually over 2000-18.¹ Economic growth in Pakistan has historically been fueled by private and government consumption, with productivity-enhancing investment and exports contributing relatively little. Furthermore, consumption-led growth has been associated with frequent macroeconomic imbalances. Achieving sustained higher economic growth is important for Pakistan to reduce inequality and increase shared prosperity.
- 2. The province of Punjab is home to over half of Pakistan’s population and characterized by stark socioeconomic divides between north and south and rural and urban areas.** While 16 percent of urban households are poor, the share of poor householder reaches 30 percent in rural areas. There is a related geographic divide: most districts in the north and the center have poverty rates of less than 20 percent, while the average district in the south has a poverty rate closer to 36 percent, reaching up to 48 percent in some districts. Similarly, child health outcomes are worse in South Punjab, with an average stunting rate of 42 percent compared to 25 percent in the north and 33 percent in the center. Women’s socio-economic standing in urban Punjab is higher than in rural areas. For example, 27.5% of women earn in cash or in-kind (rural) compared to 54.1% in urban areas. Urban women also have more control over earnings at 46%, versus 36% in rural areas. Child marriage is higher in rural Punjab at 17%, compared with 10% in urban areas.²
- 3. Pakistan is well endowed with water—but because Pakistan is the world’s sixth most populous country, water availability per person is comparatively low at around 1,100 cubic meters per capita.** Water use is heavily dominated by agriculture, which contributes around one-fifth of national GDP. Irrigation contributes around US\$22 billion to annual GDP and hydropower generation contributes US\$1 billion to US\$2 billion. Municipal and industrial water demands are increasing,³ and environmental water allocations need to be agreed and implemented. Economic modeling suggests that if the resources are properly allocated, water scarcity will not prevent Pakistan from reaching upper-middle-income status by 2047 despite projected population increase.⁴

¹ Islamic Republic of Pakistan, Leveling the Playing Field, Systematic Country Diagnostic. World Bank. 2020.

² Women’s Economic and Social Wellbeing Survey, Punjab, 2018-2019.

³ The projected increase of municipal and industrial demand by 2050 ranges from 70 to 200%, depending on the scenario.

⁴ World Bank, Pakistan: getting more from Water, 2019



- Climate and environmental challenges could compound development risks.** Pakistan is the fifth most affected country by extreme weather events due to climate change⁵. By 2050, annual average temperatures in Pakistan are projected to increase from 1 to 3 degrees Celsius. While future projections in precipitation contain significant uncertainties, research highlights risk of increased frequency and intensity of flood and drought events due to changes in seasonality, regularity, and extremes⁶. Already, Pakistan faces high risk of flooding, water scarcity, and extreme heat and remains among the top ten countries that are recurrently affected by natural hazards.⁷ Such adverse natural events result in the loss of human lives and livelihoods, infrastructure damages in urban and rural areas, disruption in business activities, as well as losses in the agriculture sector – hitting the poorest and most vulnerable the hardest. For instance, Punjab is expected to face an average reduction in living standards of 2.6 percent due to climate change.⁸

Sectoral and Institutional Context

- Punjab – the land of five rivers – relies almost entirely for all its water usage on the extensive Indus Basin Irrigation System (IBIS) that abstracts and distributes the waters from Indus River and its tributaries crossing the province.** Punjab receives on average 69 billion cubic meter from the IBIS and 28 billion from the rain and other inflows. Due to the predominantly arid and semi-arid climate, about 88 percent of the cropped area is irrigated, and irrigated agriculture accounts for more than 90 percent of water withdrawals. The irrigation system also supplies water to cities and industries and contributes 80 percent of the groundwater recharge. The groundwater reservoir is in turn used by farmers to complement the water supplies from the canal system and about 60 percent of the water used by the farmers to irrigate their crops comes from groundwater – resulting in constantly increasing pressure on this resource. This means the water needed to diversify Punjab’s economy and build resilience to climate change must come from reallocations from agriculture.
- Agriculture is a key contributor to the economy in Pakistan in general and Punjab in particular, but it has a relatively low productivity.** Punjab has vast fertile lands, consisting of about 8.8 million hectares of irrigated area which are highly suitable for diversified and productive agriculture. Yet, agricultural growth is deteriorating and crop and livestock productivity are lower than in other Asian countries. Large gaps exist between average yields, the progressive farmer yields, Punjab’s potential and the world’s best averages.⁹ Large gaps also exist between male and female farmer productivity.
- Punjab agriculture is dominated by smallholder farmers.** 90 percent of farmers in number hold less than five hectares and these smallholder farms cover 58 percent of the total farm area in Punjab. The share of female landowners is 2%, compared to 18.9% for men in rural Punjab. The distribution of land ownership is an important factor that is closely linked with rural poverty and agriculture performance. Studies indicate that economic and agricultural developments tend to focus on large farmers with limited attention paid to the small farmers, which lead to inequal and inefficient access to resources such as water and extension services for small farmers.¹⁰ Farmers who do not own land are further inhibited in their access to irrigation water, participation in the CBOs, access to credit, and compensation in case of resettlement and natural disasters.

⁵ Based on data from 1990 – 2018, German Watch, ‘Global Climate Risk Index’, 2021

⁶ Pakistan Climate Country Risk Profile. World Bank Climate Change Knowledge Portal. 2021

⁷ Global Climate Risk Index 2021, Briefing Paper. Germanwatch’s D. Eckstein, V. Kunzel, L. Schäfer (January 2021).

⁸ Mani, Muthukumar, Sushenjit Bandyopadhyay, Shun Chonabayashi, Anil Markandya, and Thomas Mosier. 2018. South Asia’s Hotspots: Impacts of Temperature and Precipitation Changes on Living Standards. Washington, DC: World Bank

⁹ For example, wheat water productivity in Punjab is estimated at 0.5 kg/m³ while it is 0.8 kg/m³ in Bhakra (India) and 1.0 kg/m³ in Imperial Valley (USA).

¹⁰ Naseer, Muhammad & Ashfaq, Muhammad & Abid, Muhammad & Razaq, Amar & Hassan, Sarfraz. (2016). Current Status and Key Trends in Agricultural Land Holding and Distribution in Punjab, Pakistan: Implications for Food Security. Journal of Agricultural Studies. 4. 10.5296/jas.v4i4.9670



8. **Inadequate management of water distribution within IBIS hampers progress towards a more productive use of the water.** The provision of irrigation services is locked in a century-old paradigm of “protective” irrigation (as prescribed in the 1873 Irrigation Act still in force) that is unable to meet present agriculture’s needs or ensure environmental sustainability. Water is allocated within each canal system based on a fixed “canal allowance” adjusted for the available river flows and distributed equally to all farmers at all times through proportional flow sharing from main to branch, distributary, minor and finally watercourse canals, without any consideration for the varying crop requirements. At watercourse level, the water is equally shared among the farmers using a rotational distribution called *warabandi*. This rigid distribution of irrigation water does not allow improvements to the adequacy of the service (matching demand with supplies) in the context of increasingly diversified agricultural production systems. Moreover, the equity and reliability of distribution – the key performance parameters of a proportional distribution service – are affected by fraud, theft and insufficient control of the flows. There is evidence that water distribution disparities affect the household incomes.¹¹
9. **Punjab needs to move from conjunctive use of surface and groundwater to conjunctive management of these two resources.** The Indus basin groundwater aquifer in Pakistan holds in storage at least eighty times the volume of fresh water held in the country’s three biggest dams and is critical to Punjab’s resilience to climate shocks. The pumping of groundwater for irrigation fueled the “green revolution” and helped resolve, to a large extent, the waterlogging issue that had become prevalent in the 1960s (before the expansion of groundwater use). Farmers use groundwater which is available at will to complement the unreliable and rigid canal water supplies. They tend to use as much canal water as possible when it is available, and the excess supply contributes to recharge the groundwater. The flat irrigation service fee (called *Abiana*) does not create any incentive for canal water savings. But the ever-increasing use of groundwater through private tube wells (now 1.3 million in number) is now causing over-abstraction and depletion of the groundwater table in areas of Central and Southern Punjab where the recharge from canal seepage and surface irrigation is proportionally lower due to their location at the tail-end of the canal system.¹² In some areas, the farmers have started pumping from deeper layers of the aquifers which are naturally more saline than the upper layers, increasing the risk of soil salinization.¹³ Moreover, lack of wastewater treatment, unaccountable agricultural and industrial practices, and weak water quality regulation and monitoring put water resources at risk across Pakistan and raise the prospect of pollution-induced water scarcity.
10. **A paradigm shift is needed in the way water resources are managed.** The distribution of canal water needs to be more reliable, adequate and flexible so that farmers can use the water efficiently without relying so much on groundwater pumping. Improved control of water associated with enhanced accountability will also result in better equity. Groundwater recharge will be reduced, but so would be its use. Farmers will save on pumping cost, and this will also reduce carbon emissions.¹⁴ Groundwater use needs to be managed conjunctively with canal water supplies to avoid opportunistic behaviors resulting in further groundwater depletion. Some level of groundwater use needs to be maintained to avoid waterlogging and the groundwater pumping capacity needs to be maintained to cope with dry years. In short, the groundwater table needs to be kept neither too high nor too low.
11. **Realizing the importance of effective water management, Punjab is setting up a new legal framework in response to the current challenges.** The Punjab Water Act enacted in 2019 provides a legislative basis to implement a groundwater management system. The upcoming Punjab Irrigation, Drainage and Rivers Act 2022 will complement

¹¹ See for example: Akhter A & al, Implications of less tail end water on livelihoods of small farmers in Pakistan, Outlook on Agriculture 2017, Vol. 46(1) 36–43

¹² Water table decline in Punjab is localized and variable, and there is no good estimate of the over-abstraction in volume. Mott Macdonald et al in 2016 report a median fall of 0.6m/a in SE Punjab, ref. <https://www.nature.com/articles/ngeo2791>

¹³ See: Groundwater in Pakistan’s Indus Basin: Present and Future Prospects, World Bank, 2021.

¹⁴ Eighty percent of tubewells in Punjab run on diesel or petrol.



the Water Act with provisions related to irrigation service delivery.¹⁵ It will replace the antiquated 1873 Irrigation Act. These legislations recognize the linkages between canal water and groundwater resources, they set up a licensing system for groundwater abstraction, and they include various measures to strengthen the quality of the canal delivery service. However, the implementation of the new legal framework has yet to begin.

12. **Punjab Irrigation Department (PID) is also establishing various systems to monitor the flows and groundwater abstractions in a more effective way and improve water distribution equity.** The PID has established the Project Monitoring and Implementation Unit (PMIU) to develop and implement improved canal flow monitoring systems, including the Irrigation Management Information System (IMIS), the Irrigation Watch Application¹⁶, the monitoring of relative flows at head and tail of canals using appropriate flow measurement devices (e.g. broad crested weirs in canals),¹⁷ the Water Resources Management Information System (WRMIS) and the Real Time Flow Monitoring System (RTFMS).¹⁸ The discharge data at the main canals are reported on the PID website¹⁹ on a daily basis and the PMIU operates a complaint management system – thus increasing transparency and building farmer’s trust in the system. A basic groundwater monitoring program is in place.
13. **These existing systems need to be further improved to generate more accurate, frequent, and useful data supporting strategic and tactical decision making on flows, water allocation and water quality control.** Improved flow monitoring is required to support the change of paradigm from the old inflexible water distribution schedule towards a more adequate and flexible service delivery and to move toward conjunctive management of surface water and groundwater. The canal systems need to be equipped with improved flow regulation structures that allow not only a more accurate measurement of the flows but also enable better control. With better control, new operational rules reflecting a more reliable, adequate and flexible service can be applied. Water allocations can be optimized. Eventually, volumetric water pricing could be introduced to replace the existing flat irrigation service fee and encourage water savings. The groundwater abstractions need to be monitored and collective management rules established with local communities.
14. **The Government of Punjab aims to accelerate the transformation needed in the water management system.** Establishing such improved water management systems is a complex and transformative intervention that requires a learning approach – based on trial and errors – before it is scaled up to the entire province. The proposed operation would help set these systems as a scalable response to the challenges at stake adapted to Punjab’s specific context and political economy. Appropriate incentives will be devised to support the PID’s move towards an improved irrigation service. Scalability will be achieved once canal operators are incentivized and farmers trust the capacity of the new systems to deliver this improved service.
15. **Improved water management systems combined with enhanced on-farm agricultural and irrigation practices will enable water productivity increases and reallocation of the water resources between different usages.** Addressing the complex and interlinked challenges of water resources management, climate resilience and food security requires a multipronged approach at the nexus of water and agriculture. A combination of on-farm and off-farm interventions are required to increase land and water productivity including evolving cropping patterns. With improved irrigation and water management systems, the PID would be in position to adjust canal deliveries in accordance with on-farm

¹⁵ Its submission to Provincial Assembly is a prior action under the proposed Pakistan Climate Resilience Development Policy Credit (P178483).

¹⁶ The data are collected mainly through manual reading and are stored in digital form with evidence of photos for ad hoc use.

¹⁷ The PMIU measures the Discharge Performance Ratio (DPR) which compares the actual flow with design flow, and compares the values obtained at head and tail of each canal, to make sure the flow is shared equitably throughout the canal. This is not, however, a comprehensive flow measurement system.

¹⁸ Deployed at every Barrage and main canal offtaking (136 flow monitoring points) and being expanded to include 1,500 points in one pilot canal system (Eastern Saddiqia Canal System).

¹⁹ Punjab Irrigation Department Website: <https://irrigation.punjab.gov.pk/> - Dynamic and interactive map viewer of river, canal and aquifer data are available on the website.



requirements, water allocations would be optimized, and volumetric pricing would become possible, generating additional financial resources for operation and maintenance, and strengthening farmer incentives for water conservation. This transformation would, in turn, enable future reallocations of the water resources from agriculture to other sectors with growing demand while building the resilience of the entire water system to climate change.

Relationship to CPF

16. **The project is consistent with the World Bank Group’s Country Partnership Strategy (CPS) FY15–19 (Report No. 84645-PK) discussed by the Board of Executive Directors on May 1, 2014, and the twin goals of reducing poverty and increasing shared prosperity.** It directly contributes to CPS Outcome 2.2 – “increased productivity in farms in selected irrigation schemes” and CPS Result Area 3 on addressing inclusion and reducing inequalities for vulnerable groups through activities under Component 1 and Component 2, which will improve the irrigation services and support conjunctive management of surface and ground water in selected areas of Punjab. In addition, the project will contribute to increasing resilience to disasters in Punjab (CPS Outcome 3.3) through supporting strengthening the Hydro-Agro-Informatics systems and improving groundwater management.
17. **The proposed project is also aligned with the World Bank’s Climate Change Action Plan (2021 – 2025) South Asia Roadmap** which identifies four priority areas for Pakistan requiring climate action: energy decarbonization; agriculture-water nexus; climate-resilient infrastructure and communities; and macro-fiscal sustainability. The project contributes to the second and third pillars. It will also be fully aligned with the upcoming Country Climate and Development Report (CCDR).

C. Proposed Development Objective(s)

18. **To improve the irrigation service and establish a functional system for conjunctive management of surface and groundwater in selected areas of Punjab.**

Key Results (From PCN)

19. **The key results indicators at the PDO level are as follows:**
 - a. Farmers receiving an improved irrigation service (number) [disaggregated by gender] where improved service is defined by:
 - i. Increased adequacy of irrigation supplies (difference between volume required and volume delivered)
 - ii. Increased reliability of irrigation supplies (difference between volume planned to be delivered and volume actually delivered)
 - b. Farmers satisfaction with the irrigation service (percentage) [disaggregated by gender]
 - c. Number (or proportion) of tubewells managed under a community water management plan
 - d. Share of communities where women have a leading role in the formulation of community water management plans

D. Concept Description

20. **Project core concept.** The project aims to (a) improve irrigation service, in terms of adequacy and reliability of the



water deliveries at the watercourse outlet, within the command area of selected branch canals; (b) establish and deploy, in the same area, improved water resources management systems including seasonal water allocation, groundwater monitoring and management, and water quality monitoring; and (c) build the capacity of PID to further expand these systems to the entire province.

21. **Geographical scope.** Two to three pilot irrigation subsystems (branch canals) will be selected during project preparation in accordance with the following criteria: unreliable and/or inadequate irrigation service; groundwater depletion; soil salinization and/or waterlogging issues; complementarities with other projects; and environmental and social screening criteria that will be developed during project preparation to assess site-specific risks. Canal systems located in part or on whole in districts affected by higher poverty and stunting rates would be prioritized, to the extent possible.²⁰ Regarding the criteria on irrigation service, farmers surveys will be conducted during project preparation to understand the challenges and opportunities related to irrigation service in Punjab.
22. **The project will consist of the following four components:** (i) Canal Modernization and Conjunctive Management of Water; (ii) Water Information Services and Institutional Strengthening; (iii) Project Management and Monitoring and Evaluation; and (iv) Contingent Emergency Response Component (CERC).

Component 1: Canal Modernization and Conjunctive Management of Water (US\$ 70 million)

23. This component will support the modernization of selected canal subsystems²¹ and the improvement of water resources management in these subsystems including both surface and groundwater. The modernization works and the capacity strengthening activities for improved canal operations will result in enhanced service delivery. Sustainable management of groundwater will be fostered through the formulation and implementation of community water management plans and groundwater recharge schemes, where feasible. This component will also finance studies to prepare the subsequent phases of the investment program.
24. **Subcomponent 1.1: Canal Modernization Works.** This subcomponent will finance works and engineering services for construction within existing canals of enhanced flow control structures (mainly head and cross regulators and watercourse outlets), addition of new social structures (bridges, washing points), and restoration of canal conveyance capacity without exceeding design capacity. Canal lining will be considered based on strict criteria such as high soil permeability and brackish groundwater. It will also finance the construction of small regulating reservoirs and water storage structures for enhanced canal flow regulation and groundwater recharge in areas where groundwater depletion is most acute.
25. **Subcomponent 1.2: Canal Operations and Groundwater Management.** This subcomponent will finance technical assistance and training of canal operators and water users for the establishment and deployment of new service standards and operating rules with increased accountability and setting up and implementation of a seasonal water allocation and scheduling process. The services provided by the project will include the development of a new irrigation service agreement reflecting the improved canal service and incorporating aspects of groundwater management, the deployment of an irrigation scheduling tool and the installation of groundwater monitoring equipment. For selected areas, community water management plans will be prepared. Various communication tools for enhanced collaboration between canal operators and water users, with a specific focus on females will be applied

²⁰ A list of priority districts has been established under the PRSWSSP and will be used for this purpose.

²¹ One subsystem being defined as a branch canal and associated distributary and minor canals.



to facilitate community engagement.

26. **Sub-component 1.3: Investment Planning and Detailed Studies for Water Resources Management (WRM).** Building upon above activities and other relevant studies (e.g., studies already done for the Ravi River²²), this subcomponent will finance technical assistance for the establishment of an investment plan and detailed studies related to the priority investments identified in the plan.

Component 2: Institutional Strengthening for Climate Resilience (US\$ 20 million)

27. The project will finance a range of activities that will contribute to institutional strengthening and improving the production and utilization of water information to support decision making on water allocation and water quality control. It also aims to create an enabling environment to support the development and adoption of new water conservation incentives (e.g., optimized water entitlements, pricing mechanism) to improve sustainable, efficient, and equitable water use in Punjab with due consideration given to water quality issues.
28. **Sub-component 2.1: Monitoring and Information Services.** This subcomponent will contribute to strengthening the existing Hydro-Agro-Informatics (HAI) services and develop new services that will contribute to (i) build the knowledge base for improved WRM and (ii) deliver decision-support tools for decision makers with a focus on the questions of water allocation and productivity. It will build on the work planned under the FAO/ GCF Project and the PRIAT in Punjab, and similar work planned in Sindh. This subcomponent will also finance equipment, small works, and training to strengthen the water quality monitoring systems in the project intervention areas.
29. **Sub-component 2.2: Evaluation and Learning Services.** The subcomponent will finance technical assistance, surveys, applied research and independent evaluations contributing to building the knowledge base that will inform the design of the broader canal modernization and water resources management program in Punjab.
30. **Sub-component 2.3: Institutional Strengthening and Stakeholders' Engagement.** This sub-component will finance technical assistance and training to help operationalize key aspects of the Punjab Water Act 2019 and the upcoming Punjab Irrigation, Drainage and Rivers Act 2022, including the development of rules, regulations, standards and operational guidelines for improved irrigation service and integrated water resources management. This subcomponent will also support the definition and prepare enabling environment for a new irrigation service pricing system to incentivize the efficient and productive use of water. It will support the Irrigation Department to improve the fee collection system and to complete the deployment of the E-Abiana system across the province. It will develop recommendations to address water pollution, particularly discharge of polluted water in rivers and canals but also groundwater pollution. All of the above will be achieved through a multi-stakeholder dialogue and behavioral change activities to build a coalition of the willing in support of the reforms.

Component 3: Project Management, Supervision and Monitoring and Evaluation (US\$10 million)

31. **This component will support the mandated government department, PID, to implement the project.** It will finance technical assistance and incremental operating costs associated to the coordination, management and implementation of the project including: (i) recruitment of consultants to support implementation of all project activities; (ii) carrying out procurement management, contract supervision and financial management, including financial and technical audits (including agreed procedures for emergency situations); (iii) carrying out environmental and social safeguards compliance and management, including citizen engagement; (iv) monitoring and evaluation of

²² Pakistan's River Ravi Eco-Revitalization Master Plan, A Road Map to Rescue and Revitalize the River Ravi and Its Tributaries, Asian Development Bank



the project; (v) carrying out coordination activities, knowledge sharing, as well as project outreach and dissemination activities.

Component 4: Contingent Emergency Response Component (US\$0 million)

32. **This component will support preparedness for, and rapid response to climate and natural disasters, emergency, and/or catastrophic event as needed.** The provisional zero cost for this component will allow for rapid reallocation of credit proceeds from other components under streamlined procurement and disbursement procedures. A CERC annex will be included in the project operations manual outlining the process for activation, criteria for eligible crisis, implementation arrangements, fiduciary and safeguards aspects and a positive list of activities that may be financed.

Legal Operational Policies	Triggered?
Projects on International Waterways OP 7.50	Yes
Projects in Disputed Areas OP 7.60	No

Summary of Screening of Environmental and Social Risks and Impacts

33. **Environmental Context.** The project activities are likely to have positive impacts on environment through improved conveyance efficiency, water resources management and ground water recharge in the project areas. Increased number of water storage structures will improve ground water recharge in the areas and will help in restoring ecosystem services of the project districts. Typical civil works related environmental risks of the project are only associated with Component-1 for improved irrigation services which include canal modernization works (entailing building enhanced flow control structures, addition of new social structures like washing points and crossing bridges and restoration of canal capacity) and small water regulating reservoirs and storage structures for ground water recharge to ensure water availability. The environmental impacts from these interventions are expected to be medium to low, temporary, predictable, and reversible and will be implemented outside the areas of high environmental value or sensitivity. Component-2, 3 and 4 are mainly soft components and not likely to have any environmental risks. In terms of institutional capacity, the Punjab Irrigation Department has adequate capacity and experience of implementing projects supported by the World Bank and has experienced environmental and social staff available. The implementing agency has not implemented any project under ESF, but trainings have been provided to their teams by WB during implementation of Pakistan ESF capacity building plans. Considering the limited scale of project infrastructure related activities under component-1 that are likely to have moderate and temporary environmental risks and impacts that can be easily mitigated, and with adequate institutional capacity of implementing agency, **the environmental risk of the project is assessed as moderate at concept stage.**

34. **Social Context.** The project interventions will focus on the improvement of the irrigation service towards more accountability and equity, and on the management of the water resources which are a common good. The overall social impact will be positive since poor irrigation service, groundwater depletion and water pollution disproportionately affect poor populations. Occupational Health and Safety (OHS) risks are expected due to health and physical hazards associated with civil works and low awareness/experience amongst employers/workers, and will be identified and managed. Social inclusion will be fostered through the provision of social structures on the modernized



canals, for which consultations with women and vulnerable and disadvantaged groups will be conducted. The location of the pilot small storages under component 1 is not known and they will likely require the use of some agricultural land, although every effort will be made to locate them on barren public lands. The change in canal operations rules might result in increased tension between head and tail enders of the canal subsystems if the new operational rules are not properly explained and implemented. **The social risks for the project are deemed moderate at concept stage.**

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APPROVAL

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