



**The World Bank**

Sindh Water and Agriculture Transformation Project (SWAT) (P167596)

# Combined Project Information Documents / Integrated Safeguards Datasheet (PID/ISDS)

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Appraisal Stage | Date Prepared/Updated: 11-Nov-2022 | Report No: PIDISDSA28887

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

Country Pakistan	Project ID P167596	Project Name Sindh Water and Agriculture Transformation Project (SWAT)	Parent Project ID (if any)
Region SOUTH ASIA	Estimated Appraisal Date 08-Nov-2022	Estimated Board Date 19-Dec-2022	Practice Area (Lead) Water
Financing Instrument Investment Project Financing	Borrower(s) Islamic Republic of Pakistan	Implementing Agency Sindh Agriculture Department, Sindh Irrigation and Drainage Authority, Sindh Planning & Development Department - Project Coordination and Management Unit	

## Proposed Development Objective(s)

To increase agricultural water productivity in selected Farmer Organization command areas, improve integrated water resources management, and contribute to restoring crop production by small farmers affected by the 2022 floods.

## Components

- Component 1: Water Resources Management
- Component 2: Water Service Delivery
- Component 3: Targeted Agricultural Incentives and Investments
- Component 4: Project Coordination and Monitoring
- Component 5: Agriculture Flood Emergency Rehabilitation
- Component 6: Contingent Emergency Response

**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

Environmental Assessment Category

A-Full Assessment

Decision

The review did authorize the team to appraise and negotiate

## B. Introduction and Context

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. 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 limited gains. Growth of per capita gross domestic product (GDP) has been low and volatile, averaging under two percent in the last two decades. Recent unprecedented floods are likely to have serious impacts on poverty, human development outcomes and economic growth.
2. **The recent floods have had enormous human and economic impacts.** Pakistan experienced heavy monsoon rains between June and September 2022 which has severely affected millions of households, mainly in Sindh and Balochistan. Around 33 million people have been displaced, and more than 13,000 kilometers of roads destroyed. The flooding has damaged 2 million houses, flooded around 9.4 million acres of crops, and killed an estimated 1.1 million livestock, adversely affecting rural livelihoods. 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. Food shortages are



expected to intensify in the fall and winter due to significant crop and livestock losses. Preliminary estimates suggest that as a direct consequence of the flood, the national poverty rate may increase by 2.5 to 4.0 percentage points, potentially pushing around 9.1 million people into poverty. The recently completed Post Disaster Needs Assessment 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. **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 change.<sup>1</sup> Extreme weather events have been increasing in frequency and intensity, impacting ecosystems, people, settlements, and infrastructure. Heat waves, heavy precipitation events, droughts, and cyclones are prevalent risks. The country experiences some of the highest temperatures in the world, with several areas recording temperatures of over 38 degrees Celsius annually. During the 2015 heat wave, more than 65,000 people were hospitalized with heat stroke, with 1,200 deaths recorded, mostly in Sindh.<sup>2</sup> Projected temperature increases in Pakistan are higher than the global average, as high as 5.3 degrees Celsius by 2081-2100 under the highest emissions Representative Concentration Pathway (RCP8.5), compared to a global average temperature increase of 3.7 degrees Celsius in the same scenario.<sup>3</sup> There is also significant uncertainty surrounding future precipitation rates in Pakistan, underscoring the need for better preparedness for unforeseen extreme precipitation events. Research highlights the risk of increased frequency and intensity of flood and drought events, brought on by changes in the seasonality, regularity, and extremes of precipitation.<sup>4</sup> The probability of meteorological drought, usually brought on by below-normal precipitation, is set to sharply increase under all emission pathways – from the current probability of 3 percent to a 25-65 percent probability of severe drought, which can cause significant damage to crops and livelihoods.<sup>5</sup> These changes in climate and extreme events are likely to disproportionately affect the most disadvantaged groups, among these low-income businesses, those engaged in manual labor jobs, poorer farmers, women, and children.

#### Situation of Urgent Need of Assistance or Capacity Constraints

4. **The 2022 monsoon rains triggered the most devastating flooding in Pakistan's history, affecting all four provinces and impacting 15 percent of the population.**<sup>6</sup> Millions of people remain in need of humanitarian assistance, hundreds of thousands of homes have been destroyed, critical infrastructure such as road networks, bridges, and water systems has been damaged, and livelihoods lost. Significant damages to houses, transport, agriculture, irrigation, and communication infrastructure have also been reported in Sindh province. Given the scale of the current disaster, the government requires support related to immediate relief, recovery, reconstruction, and increasing resilience in the aftermath of the floods.
5. **Since the onset of the flooding, the GoP has been engaged in emergency response and relief.** Of the PKR 70 billion (US\$319 million) earmarked to assist flood-affected people, the Benazir Income Support Programme (BISP) has disbursed approximately PKR 65 billion (US\$296 million) to over 2.6 million flood-

<sup>1</sup> Germanwatch, Global Climate Risk Index 2021. <https://www.germanwatch.org/en/19777>.

<sup>2</sup> Technical Report on Karachi Heat wave June 2015, Ministry of Climate Change, Government of Pakistan. <https://mocc.gov.pk/SitelImage/Misc/files/Final%20Heat%20Wave%20Report%203%20August%202015.pdf>

<sup>3</sup> World Bank, Climate Risk Country Profile: Pakistan.

<sup>4</sup> Ibid.

<sup>5</sup> Ibid.

<sup>6</sup> Pakistan: 2022 Monsoon Floods, Situation Report No. 9 as of 14 October 2022.



affected households as of October 15, 2022. Beyond financial support, the National Disaster Management Authority (NDMA) and the Provincial Disaster Management Authority (PDMA) have been providing in-kind support such as tents, rations, mosquito nets, dewatering pumps, medicines, and drinking water; they have also established evacuation camps for displaced persons. Damage assessment teams have been deployed on the ground; and the country's armed forces have been supporting the government's rescue and relief efforts. The government has established a National Flood Response and Coordination Centre, which includes representatives from the federal and provincial governments as well as the armed forces, to coordinate flood response, relief, and rehabilitation across the country. In collaboration with the United Nations (UN), the government issued a flash appeal (based on the 2022 Pakistan Floods Response Plan) which seeks US\$816 million to respond to the needs of the people. Pledges from donors have reached US\$180 million, with only US\$90 million (11 percent) currently committed. National and international organizations are assisting affected populations through distribution of food and non-food items as well as provision of water and sanitation, hygiene, and health services.

6. **The Post Disaster Needs Assessment (PDNA) undertaken by the GoP, the World Bank (WB), the Asian Development Bank (ADB), the UN, and the European Union suggests that the housing, agriculture, transport, water supply and sanitation, and irrigation sectors bear the brunt of the damage.** For Sindh, the overall needs assessment for post-flood recovery and reconstruction stands at US\$7.9 billion, which is highest of all the provinces. In particular, damage to housing or settlements (US\$4.3 billion), water resources and irrigation infrastructure (US\$442 million), transport and communications (US\$311 million), and water supply, municipal services, and community infrastructure (US\$421 million) is substantial.

#### Sectoral and Institutional Context

8. **Sindh is the second largest province of Pakistan with significant levels of rural poverty and a high reliance on irrigated agriculture.** Covering an area of 140,914 km<sup>2</sup> (17.7 percent of the total area of Pakistan), 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 is below the poverty line—higher than the Pakistan average. 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.<sup>7</sup> Poverty levels in rural Sindh are closely correlated with farm size or tenure relationship as small farmers tend to have less access to technologies, credit, water, and government support programs.<sup>8</sup>
9. **The province is particularly vulnerable to natural disaster events due to its geographical location, socioeconomic vulnerability, and climatic conditions.** These include drought, heatwaves, floods, cyclones, windstorms, tsunamis, sea intrusion, and earthquakes. Agricultural land in the low-lying areas of Sindh, downstream of the Indus, is highly exposed to flooding, threatening food security in the province and across the country. The floods in 2010, primarily riverine, caused damages of US\$4.3 billion in the province with almost 900,000 houses completely or partially destroyed, along with major impact on agriculture and infrastructure.<sup>9</sup> The 2011 rain-induced floods in Sindh had a major impact on agriculture, livestock, and

<sup>7</sup> Household Income and Expenditure Survey (HIES) 2015-2016, Pakistan Bureau of Statistics.

<sup>8</sup> Approximately 83 percent of farms are less than 5 ha 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. Abdul Wajid Rana and Heman Lohano (forthcoming), Sindh Water and Agriculture Sector Public Expenditure Review. World Bank.

<sup>9</sup> Pakistan Floods 2010: Preliminary Damage and Needs Assessment.



fisheries, as well as housing. Sindh is also home to a large fraction of the coastal areas of Pakistan, which are at a significant risk from a projected rise in sea-level, which may go up to 40cm by the end of the 21st century even under conservative scenarios.<sup>10</sup> The high prevalence of poverty, as much as 40-60 percent in certain districts, further exacerbates the vulnerability of the province.<sup>11</sup> These areas also face inadequate health services, water and sanitation, schooling, and limited access to electricity.

10. **Sindh has been disproportionately affected by the 2022 floods.** The province is estimated to have received rainfall in excess of 400 percent over the 30-year average. According to the National Disaster Management Authority (NDMA) 792 of the 1,731 nationwide casualties were in Sindh, including 336 children, with 8,422 people injured. At least 1.7 million houses in Sindh were damaged or destroyed, nearly 83 percent of the nationwide total.<sup>12</sup> Reports estimate that more than 4.9 million acres of agricultural land has been affected in Sindh alone, which could contribute to food shortages in the near future.<sup>13</sup> Vast areas in 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 gave rise to skin, gastric, and mosquito-borne diseases. As of September 2022, most flood waters have receded with only 2.83 percent of the province inundated.<sup>14</sup> Emergency rehabilitation is essential to facilitate those impacted.

#### *Irrigated Agriculture Context and Key Challenges*

11. **Affected severely by the 2022 floods, irrigated agriculture is the mainstay of rural Sindh, but a lack of modern integrated water resources management is undermining environmental sustainability and impacting economic growth and public health.** 77 percent of the net area sown in Sindh is irrigated.<sup>15</sup> The Indus River, which also supplies drinking water in Sindh and supports critical ecosystem services, is already depleted by water withdrawals, yet agricultural water requirements are projected to significantly increase if current irrigation and cropping practices are not changed.<sup>16</sup> However, current water withdrawals is inefficient, with an estimated 60 to 75 percent of the water withdrawn is lost either to surface water evaporation or seepage into saline groundwater.<sup>17</sup>
12. **Low agricultural water productivity leads to inefficient use of limited water resources.** 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 averages yields in China are 52 percent for wheat, 54 percent for rice, 43 percent for cotton, and 81 percent for sugarcane.<sup>18</sup> 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, water-thirsty crops account for 80 percent of cropped land. Second, crop 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

<sup>10</sup> World Bank, Climate Risk Country Profile: Pakistan.

<sup>11</sup> Country Climate and Development Report: Pakistan. World Bank.

<sup>12</sup> NDMA Floods Daily Situation Report No 134, 2022. <https://cms.ndma.gov.pk/storage/app/public/situation-reports/October2022/XrV4usz635AnF4WiNVrf.pdf>

<sup>13</sup> Provincial Disaster Management Agency Sindh, 19th September 2022 as cited in FAO Monsoon Flood Situation Update – Pakistan September 27 2022.

<sup>14</sup>FAO Rapid Geospatial Flood Impact Assessment Pakistan, September 2022

<sup>15</sup> Abdul Wajid Rana and Heman Lohano (forthcoming), Sindh Water and Agriculture Sector Public Expenditure Review. World Bank.

<sup>16</sup> *Sindh Agriculture Policy: 2018-2030* (2018) Government of Sindh

<sup>17</sup> *The Irrigation Management Strategy for Irrigated Agriculture of Sindh, Province (Pakistan), Fourth Draft*, Planning and Development Department, Sindh Government, pg. 37 (unpublished)

<sup>18</sup> Ibid.



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 2002, contributing to chronic under maintenance and poor service delivery.<sup>19</sup>

13. **Sindh's multi-purpose 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 multi-purpose canal network depends entirely on the Indus River. It serves agricultural, industrial, urban, and rural users through three large barrages which divert approximately 48 million acre-feet (59 billion cubic meters (BCM)) of water, 90 percent of which is used to irrigate a gross command area of roughly 5.8 million hectares.<sup>20</sup> 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 (DOs), 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. Finally, 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.<sup>21</sup> 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.<sup>22</sup>
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 the primary legal instrument governing irrigation and drainage in Sindh Province. In 2002, in order to introduce participatory irrigation management, the GoS adopted the Sindh Water Management Ordinance (SWMO). The SWMO created the Sindh Irrigation and Drainage Authority (SIDA), Area Water Boards (AWBs), and Farmer Organizations (FOs). 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. Although the SWMO approach has demonstrated improvements in irrigation services, there are several deficiencies that need to be addressed. First, there are two competing legal regimes creating ambiguity. Second, the role of SIDA and AWB within the Irrigation Department needs to be clarified. Rather than serving as an Authority, SIDA evolved into an important 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.

<sup>19</sup> Abdul Wajid Rana and Heman Lohano (forthcoming), Sindh Water and Agriculture Sector Public Expenditure Review. World Bank.

<sup>20</sup> The Louis Berger Group Inc. In Association with Indus Associated Consultants (Pvt.) Ltd. Preparation of regional plan for the left bank of Indus, delta and coastal zone. Phase 3 Draft Report. November 2012.

<http://sida.org.pk/download/lbg/phasesIII/Volume%20I&%20II%20-%20Draft.pdf>

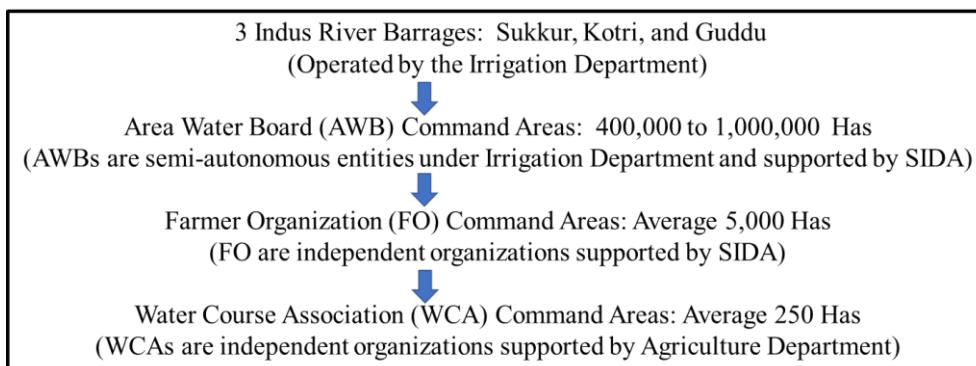
<sup>21</sup> IUCN, 2007, *Sindh Strategy for Sustainable Development. International Union for the Conservation of Nature.*

<sup>22</sup> Sindh Planning and Development Department (2016), *The Irrigation Management Strategy for Irrigated Agriculture of Sindh Province.*



- 15. Fragmentation in the management of Sindh's sprawling, hierachal and multijurisdictional canal network impedes improvements in water productivity.** The three barrages divert water into 14 main canals, 114 secondary canals, and 1,400 distributary canals. These distributary canals in turn feed approximately 44,000 water courses. An average FO command area is around 5,000 ha (12,355 acres) and includes 24 Water Course Associations (WCAs) which average around 250 ha (600 acres). In the Sindh administrative system, the Irrigation Department supports the AWB and the FO canal networks up to the WCA off-take point; the Agriculture Department supports the WCA canal network as well, providing agricultural technical assistance. The entire network at all three levels—AWB, FO, and WCA, needs to be upgraded to reap full benefits. A schematic of the arrangements is shown in the figure below.

**Sindh Irrigation Hierarchy**



- 16. Apart from the deficiencies in the irrigation infrastructure, existing agriculture policies and practices also impede water productivity.** For instance, despite resource constraints and changing dietary patterns, low-value, water-thirsty crops are prevalent in Sindh.<sup>23</sup> For example, water-thirsty crops currently constitute the following shares of cropped land: 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 ill-equipped to meet this demand despite Sindh's rich soil, water, and solar resources. Higher value, water-thrifty crops such as fruits, vegetables, pulses, oilseeds, condiments, and flowers account for only 22 percent of total cropped land. Over the last decade, the overall percentage of high-value, water-thrifty cropland has decreased.<sup>24</sup>

- 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 province 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 FY2018/2019 were approximately PKR67 billion (US\$300 million), out of which PKR24 billion (US\$155 million) were provincial subsidies.<sup>25</sup>

- 18. The wheat procurement subsidy is a drain on the Sindh provincial budget.** The wheat procurement subsidy has increased from PKR0.7 billion (US\$3 million) in FY2005/2006 to PKR15.4 billion (US\$70 million) in FY2020/2021--approximately 60 percent of all provincial agriculture-related subsidies, with outstanding

<sup>23</sup> Household Income Expenditure Surveys as cited in Abdul Wajid Rana and Heman Lohano (forthcoming), Sindh Water and Agriculture Sector Public Expenditure Review. World Bank.

<sup>24</sup> Abdul Wajid Rana and Heman Lohano (forthcoming), Sindh Water and Agriculture Sector Public Expenditure Review. World Bank.

<sup>25</sup> Abdul Wajid Rana and Heman Lohano (forthcoming), Sindh Water and Agriculture Sector Public Expenditure Review. World Bank.



commodity debt of PKR150 billion (US\$684 million). The original wheat procurement program was introduced in the 1950s when Pakistan was a food-deficient country. Still, the current system is not achieving its intended policy objectives as it is now benefitting the large farmers, millers, intermediaries, and banks while penalizing urban consumers and rural poor who are net consumers of wheat/wheat flour.

19. **Lack of access to markets and finance also impedes 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 even though prices are low. This constant financial pressure prevents them from taking risks associated with diversification and moving into new markets to increase their income.
20. **The sector's development also faces enormous climate resilience challenges.** Sindh lies at the tail end of the Indus River and is 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.<sup>26</sup>
21. **While women could play a significant role in improving agricultural water productivity, they are currently excluded from decision-making related to cropping or irrigation management.** Women make up 39 percent of the labor force in agriculture,<sup>27</sup> but female members in FOs are only five percent in FOs and three percent in WCAs. Women are even more limited in leadership roles, with only five percent representation in FOs and zero percent in WCAs.<sup>28</sup> Women's exclusion is due in part 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 is limited under double and triple burdens as unpaid caregivers with household and reproductive responsibilities as well 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<sup>29</sup>, particularly in science, technology, engineering, and mathematics (STEM) fields<sup>30</sup>), lack of female role models within the relevant agencies, and workplace inequities that 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 AWBs and FOs. However, these efforts are still in their infancy.

#### ***Actions to Address Key Sector Development Challenges***

22. **In 2018 the Government of Sindh (GoS) adopted a new Agriculture Policy that provides a framework for**

<sup>26</sup> Ahmad, Mobin-ud-Din, et al. (2020). *Sindh water outlook: Impacts of climate change, dam sedimentation and urban water supply on irrigated agriculture*. Technical Report. Sustainable Development Investment Portfolio project. CSIRO, Australia.

<sup>27</sup> Nuzhat Ahmad and Huma Khan 2016. Measuring Women's Disempowerment in Agriculture in Pakistan. IFPRI Discussion Paper 01512

<sup>28</sup> Estimated by SIDA and Agriculture Department.

<sup>29</sup> In 2017, 24 percent of women received formal education in rural Sindh compared with 58 percent of men. Pakistan Bureau of Statistics, Government of Pakistan. Labour Force Statistics (2017).

<sup>30</sup> A World Bank Utility Survey highlighted that out of 17.7% women employees in water utilities, women managers make up only 23.3%. This trend is also seen in Pakistan. World Bank. 2019. Women in Water Utilities: Breaking Barriers. World Bank, Washington, DC. © World Bank.



**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 agriculture, and (vi) focusing on effective communication and monitoring and evaluation (M&E). The policy highlights the GoS's intention to (i) liberalize and deregulate the sector and work with commercial lenders and the private sector to enhance investments and finance into agriculture, (ii) move public expenditure away from inefficient and ineffective programs, (iii) launch agriculture and livestock insurance programs to reduce income variability for farmers, and (iv) facilitate and promote technological improvement along the entire value chain, particularly for products such as fresh and processed fruits, vegetables and livestock products.<sup>31</sup>

23. **The GoS has formulated a new water policy, which they plan to formally adopt in 2023.** The water policy addresses many critical sector constraints highlighted above.<sup>32</sup> It calls for improving multi-purpose canal operations, enhancing irrigation 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, the establishment of a multi-sectoral Sindh Water Resources Commission, preparing the Sindh Strategic Water Plan (SSWP), and the establishment of a hydrological and agricultural informatics (HAI) program.
24. **Against this backdrop, the GoS has requested World Bank support to transform irrigated agriculture and water resources management by implementing the principles and actions embodied in these two policies.** The Sindh Water and Agriculture Transformation Project (SWAT or “the Project”) therefore focuses on contributing to flood response while focusing on critical sector development priorities of improving agricultural water productivity by addressing institutional, information, and infrastructure bottlenecks at the nexus of agriculture and water management policies and practices. Also, in response to the devastation brought by the 2022 floods, the project will contribute to rehabilitation expenditures, particularly to support small farmers recover from this disaster.

### C. Proposed Development Objective(s)

Development Objective(s) (From PAD)

To increase agricultural water productivity in selected Farmer Organization command areas, establish an institutional framework for integrated water resources management, and contribute to restoring crop production by small farmers affected by the 2022 floods.

#### Key Results

- Number of FO subprojects in which agricultural surface water productivity increases by at least 20 percent subprojects (12 FOs)
- Number of FO subprojects where the AWB delivers the agreed upon water volumes in compliance with the FO-AWB service agreements (12 FOs)
- Acres of water thrifty crops supported through the smart subsidy scheme (165,000 acres)
- Sindh Strategic Water Plan approved by the Sindh Water Resources Commission (Yes/No)

<sup>31</sup> Government of Sindh (2018), *Sindh Agriculture Policy: 2018-2030*.

<sup>32</sup> Sindh Water Policy Committee (2022). *Water Policy Framework Working Paper*



- Number of small farmers who receive cash transfers and harvest a 2022-2023 Rabi Crop (Number)

#### D. Project Description

**25. Transformation Process:** The project is designed to start the transformation process on several fronts, including: (i) creating an institutional framework for IWRM; (ii) modifying a century-old system of rigid irrigation practices through a modernization process centered on flexibly meeting the water needs of farmers; (iii) moving away from a system of perverse agricultural subsidies to smart subsidies that encourage high-value, water-thrifty crops; (iv) increasing investments in agricultural technology and promoting value chain development that boost agricultural productivity from the supply and demand sides, respectively; and (v) synchronizing agricultural and irrigation investments through a community driven development process at the FO level that will help ensure on-the-ground results that directly benefit farmers. Underlying the transformation process is the promotion of key policy reforms using an Investment Project Financing (IPF)-Performance-Based Conditions (PBC) modality.

**26. Component 1: Water Resources Management.** This component establishes a provincial Integrated Water Resources Management (IWRM) system. It is inter-disciplinary in its activities and is implemented by the PCMU within the Planning and Development Department (PDD). Improving water resources management helps Sindh province better cope with climate change by improving monitoring systems, utilizing adaptive planning approaches that take climate uncertainty into account, and improving resilience to floods and droughts. There are three subcomponents:

- **1.1 Institutional development for IWRM.** This includes formulation of a new water law, studies for the transformation of the Irrigation Department into the Irrigation and Water Resources Department (IWRD), capacity building, and studies and consultations to comprehensively reform the irrigation water fee (*abiana*) system.
- **1.2 Technical assistance for the development of a Sindh Strategic Water Plan (SSWP)** to establish a road map for IWRM in the province.
- **1.3 Support for a Hydro-Agro Informatics (HAI) program** that uses a combination of remote sensing and ground-based observations related to water and agriculture parameters to provide information on water balances, cropping patterns, irrigation requirements, and drought and flood monitoring.

**27. Component 2: Water Service Delivery.** This component improves the performance of the multi-purpose canal network and irrigation service to farmers. It is implemented through SIDA, which is under the Irrigation Department. It improves 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. 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:

- **2.1 Integrated development of 15 FO areas** using a CDD process to select a package of synergistic irrigation and agriculture investments to improve agriculture water productivity in the Ghotki, Nara, and Left Bank AWBs.
- **2.2 FO, AWB, and SIDA Capacity Building,** including promoting participatory irrigation management, introducing better water control management practices, improved irrigation scheduling, and increasing accountability of the AWB and FOs to provide adequate service to farmers.
- **2.3 Left Bank main canal upgrading.** This involves the upgrading of Akram Wah canal, a 116-kilometer



multipurpose canal on the Left Bank of the Indus River providing water to 187,000 has of agriculture land and multiple cities including the second largest city in Sindh, Hyderabad. The component will also finance studies for improving the operation of the Left Bank canal network, including potentially new control structures on main canals.

- **2.4 Right Bank studies and small-scale high-priority works** will finance detailed studies, including safeguards documents, for the renovation of three main canals on the Right Bank supplied from Sukkur Barrage (Dadu, Rice and Northwest Canals), as well as the Warah branch canal. It also includes small-scale high priority works on the Right Bank for damaged structures requiring urgent rehabilitation.
28. **Component 3: Agricultural Incentives and Investments.** 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 farmers' resilience, reduce agricultural GHG emissions, and increase carbon sequestration. Gender activities include ensuring female farmers receive culturally appropriate training activities and access to finance and increasing the representation of female professionals in the Agriculture Department. The activities are implemented by the Agriculture Department through five subcomponents:
- **3.1 Integrated development of the same 15 FOs supported under Component 2.1.** Using the same CDD approach as subcomponent 2.1, this subcomponent finances agriculture-related investments at the WCA level within the FO, such as on-farm water management improvements, selective use of high-efficiency irrigation systems (HEIS), land leveling, drainage improvements, and training on climate smart agriculture practices.
  - **3.2 Financing smart subsidy payments to farmers and facilitating wheat procurement reform.** A pilot smart subsidy approach will involve (i) subsidized seeds for selected crops through an e-voucher system and (ii) direct income support through the banking system to small farmers growing water-thrifty crops.
  - **3.3 Improving the agricultural information and technology base,** including agricultural statistics, crop reporting, market information services, and establishes a salinity and water logging research program.
  - **3.4 Developing the agriculture value chain** by supporting farmer groups and medium-sized agribusinesses, prioritizing those located within the integrated FO subproject areas, including the following types of activities: i) assessing different project areas and markets to identify candidate value chains and associated constraints; and ii) supporting farmers through free technical assistance and partially subsidized investments (up to 60 percent and a US\$ 15,000 cap) against a positive list of eligible expenditures.
  - **3.5 Agriculture Delivery Unit (ADU) support,** including consultant support, equipment, and incremental operating costs.
29. **Component 4: Project Coordination and Monitoring Support** for overall project coordination and monitoring and ensures the integration of the components to address the water–agriculture nexus.
30. **Component 5: Agricultural Flood Emergency Rehabilitation Component.** This component will provide cash transfers to small farmers affected by the 2022 floods reestablish their agricultural production, with an emphasis on the 2022-2023 Rabi crop. It will also finance supporting services provided by NGOs and consultants, as well as the incremental operating costs incurred by the Agriculture Department.
31. **Component 6: Contingent Emergency Response:** Following an adverse natural event that causes a major natural disaster, the government may request the World Bank to reallocate project funds to support response



and reconstruction. This component could also be used to channel additional financing from the World Bank should they become available for such an emergency.

#### **E. Implementation**

##### Institutional and Implementation Arrangements

32. A Project Steering Committee (PSC) has been formally established to provide oversight and ensure coordination. The PSC is headed by the Chairperson of the Provincial Planning and Development Board, who is also the Chairperson of the PDD. The Secretaries of Irrigation and Agriculture are also members of the PSC, along with Secretaries from the Finance and Food Departments. The PSC meets on at least a biannual basis and is supported by a technical working group, 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 Director and supported by three Deputy Directors with responsibilities for irrigation, agriculture, and monitoring and evaluation.
33. Since an IWRM system does not yet exist in Sindh, Component 1 will be implemented by the PCMU in close collaboration with relevant departments. Component 2 will be implemented by SIDA which is under the Irrigation Department, and in close collaboration with three AWBs (Ghotki, Nara, and Left Bank) and FOs. Component 3 will be implemented by Agriculture Department through its ADU in close collaboration with the WCAs, research institutes, and agri-businesses. The ADU will work across the different divisions in the Agriculture Department, as well the Food Department which is responsible for the provincial wheat procurement program.

#### **F. Project location and Salient physical characteristics relevant to the safeguard analysis (if known)**

The project is located in the irrigated areas of Sindh province. The area is characterized by flat lands with inadequate land drainage features. Irrigation returns and drainage effluent are drained either through man-made surface drains or collected in naturally occurring depressions, which are also used as fishponds. Due to limited drainage, secondary salinization is one of the reasons for land degradation in the province. Extensive irrigation network with inadequate drainage also creates localized waterlogging, another important reason for land degradation. Soils in the province, otherwise, are fertile and very productive. Right bank of the Indus river is generally cultivated with wheat-rice and the left bank is known for wheat-cotton and wheat-sugarcane cropping pattern. There are several protected areas, games reserves and wildlife sanctuaries in Sindh. Though civil works are expected to be limited to the areas that are cultivated and irrigated already, any civil work which would be carried out within the protected areas will be avoided during project preparation and if they cannot be avoided appropriate management measures will be developed and implemented to mitigate any impacts.



#### G. Environmental and Social Safeguards Specialists on the Team

Takeaki Sato, Environmental Specialist

Babar Naseem Khan, Social Specialist

Najm-Ul-Sahr Ata-Ullah, Social Specialist

#### SAFEGUARD POLICIES THAT MIGHT APPLY

Safeguard Policies	Triggered?	Explanation (Optional)
Environmental Assessment OP/BP 4.01	Yes	<p>The Project is rated as Category A. In accordance with the World Bank's IPF Financing Policy, Paragraph 9, the Project utilizes the Bank's Safeguard policies because the Concept Note was approved in September 2018 and the Borrower has prepared the safeguard instruments accordingly. The team performed a gap analysis between Safeguards requirements and requirements under the new ESF to identify and address any gaps in the E&amp;S instruments prepared. It is rated as category A due to the complexities surrounding the Akram Wah Social Management and Resettlement Plan (SMRP). In addition, there are two environmentally important technical assistance activities: i) the Sindh Strategic Water Plan, which will include a scenario-driven Cumulative Impact Assement (CIA) to identify sustainable water resources development pathways; and ii) the preparation of a feasibility study, ESIA, and RAP for the renovation of Right Bank main canals. The following instruments have been prepared to help mitigate environmental and social risks: project-wide Environmental and Social Management Framework (ESMF); Akram Wah ESIA; Akram Wah SMRP, and the Resettlement Policy Framework (RPF). All local and World Bank consultation and disclosure requirements have been met, including submission to the World Bank Board of Executive Directors on May 3, 2022.</p> <p>The ESMF lays out the institutional arrangements, staffing requirements, and budget for implementing environmental and social management activities.</p>



The scope of work for the Sindh Strategic Water Plan is included in the ESMF. It outlines the general methodology for preparing the Plan, which includes examining cumulative impacts of water resources management and development on the valued environmental components of Sindh's water-based ecosystem. The methodology includes developing a stakeholder engagement and capacity building plan to elicit input from a broad variety of groups, including provincial agencies, local governments, farmers, NGOs, academia, women, minority groups, and the public. The goal is to develop strategic plans for 50- and 25-year horizons, as well a 5-year action plan, to help to put water management in Sindh on a more sustainable trajectory in the context of climate change. The Karachi Water and Sewerage Board, which is implementing the Bank-financed Karachi Water and Sewerage Services Improvement Project (P164704) 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 preparation of feasibility studies and associated ESIA and RAP will be governed by the provision of the ESMF and the RPF. Since SWAT will also support emergency response to the recent floods in Sindh, ESMF contains the ESMP specifically applicable to Component 5:Agricultural Flood Emergency Rehabilitation Component (FERC).

For the FO sub-projects, the locations have not yet been confirmed and they will be subject to the provisions of the ESMF. It is anticipated the FO subprojects are likely to fall into the moderate and low-risk categories. The ESMF includes environmental and social screening procedures, as well as standard templates for ESIAAs (as required) and ESMPs for Component 2 and 3 civil works. In addition, the ESMF includes Environmental Code of Practices (ECPs) to address all generic construction impacts which will be attached to the bidding documents of all construction works along with the ESMPs.

Akram Wah ESIA/ESMP. The EISA 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 Plan (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 under the ESMP. To minimize loss of permanent wetland habitat and agricultural land, thirty 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 RoW have been identified. Occupational Health and Safety (OHS) risks are considered significant and include handling of hazardous materials, electrical works, use of machinery, working at heights, excavations. The contractor shall be required to complete a Health and Safety Plan (HASP) to cover all construction operations for the approval by Engineer before commencement of works. The ESMP includes provision for managing the influx of outside labor, including managing potential gender-based violence issues.

A Gender and Inclusion assessment was carried out to identify the impacts on women and marginalized groups, and the hurdles faced by these groups to benefit from proposed project interventions. This assessment also examines available citizen engagement mechanisms from a social inclusion, gender and conflict management perspective to recommend the most effective social mobilization process and engagement for the Project. The Gender Action Plan was developed based on the assessment and included in ESMF to ensure adequate management of gender, vulnerability and social exclusion related impacts, and to strengthen social mobilization and citizen engagement.

Performance Standards for Private Sector Activities OP/BP 4.03	No	The project will be implemented by three governmental agencies.
Natural Habitats OP/BP 4.04	Yes	The river stretch between Guddu Barrage and Sukkur Barrage, where Rice and Dadu canals originate, is a Sindh Wildlife Reserve and a Ramsar site since the river stretch is the core habitat of endangered Indus River Dolphin. Rice and Dadu



		canals are also supplying the water to Manchar Lake, which is the largest freshwater lake in Pakistan.
		While the canal rehabilitation and modernization works will be likely to be undertaken outside these important ecological habitats, the project will pay due attention not to harm these ecological habitats. In addition, the outcome of the policy reform and SSWP might affect the quality of these ecological habitats. Hence, the policy is triggered. ESAs/ESMPs of each physical investment will assess the potential impacts and propose mitigation measures following the mitigation hierarchy. Likewise, long-term ecological impacts due to policy reform and SSWP will also be covered in the CIA as part of SSWP.
Forests OP/BP 4.36	No	While upgradation of Akram Wah canal will require clearance of trees along the canals, the project activities are not envisaged to cause degradation or conversion of the riverine forests in Indus River Basin. Therefore, this policy is not triggered. However, the contractor for Akram Wah canal upgradation will be required to replant at least five times as many mature trees in the vicinity of the canal under the ESMP and the applicability of the policy will be re-examined once all project locations are known. If the policy is triggered, detailed impact analysis and necessary mitigation measures will be included in ESAs/ESMPs.
Pest Management OP 4.09	Yes	The project will not procure any pesticides. However, the project would change the pesticides application practice through the project activities such as promotion of climate smart agriculture (CSA), application of new crops and agricultural practices. These interventions are expected to have low but positive impacts on pest management. Integrated Pest Management measures are proposed in ESMF.
Physical Cultural Resources OP/BP 4.11	Yes	This policy is precautionarily triggered since project locations are unknown for most of the activities. The potential existence of historical and cultural resources will be examined in the course of sub-project preparation and implementation. Physical and Cultural Resource Management Framework and Chance Find Procedures are included in ESMF to



		address the unforeseen identification of cultural resources in the project area.
Indigenous Peoples OP/BP 4.10	No	This policy is not triggered as the only recognized Indigenous People of Pakistan, the Kailash, reside in the Chitral Valley which is outside the project's geographical area.
Involuntary Resettlement OP/BP 4.12	Yes	<p>In early 2021, while preparation of SWAT was ongoing, the Sindh High Court mandated that the Irrigation Department undertake an Anti-Encroachment Drive (AED) for all its property throughout the province, including clearing the right-of-way (RoW) of the Akram Wah canal. An estimated 1,246 households were affected, with more than 90% experiencing significant impacts. In addition, there are 112 households in the RoW near the end of the canal who were not affected by the AED but will need to shift their structures outside of the area of impact. Most of the AED affected households were poor, informal settlers who were displaced from their homes. To address these legacy issues, SIDA prepared the SMRP which will: i) ensure full replacement of lost assets and provide an opportunity for AED affected households to improve their standard of living; and ii) pilot an approach to allowing AED affected households back on to the RoW in accordance with an Irrigation Department policy that was adopted in mid-2022. The SMRP is in compliance with OP4.12 and consistent with ESS 5.</p> <p>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. Commercial properties consisted primarily of small mobile kiosks, and owners will be compensated for lost assets and temporary loss of income. The SRMP provides opportunities for livelihood enhancement through 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. In accordance with overall Irrigation Department policy, SIDA will pilot an</p>



approach whereby AED-affected households are granted permission to move back into the RoW in a supervised manner. The households must self-construct houses that meet minimum standards; extremely poor and/or vulnerable households will also be provided additional cash support and technical support as necessary. SIDA will ensure that no new encroachments occur on the RoW, and the households are protected from any future AED activities. The SMRP also covers resettlement of non-AED affected households, land acquisition outside of the RoW, and removal of community structures and public infrastructure within the RoW. A Sindh Panel of Experts has endorsed the SMRP and will provide oversight throughout its implementation. 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 further encroachment on the RoW from flood-displaced people.

Preparation of RAPs and ESAs for Right Bank main canal upgrading (Component 2.4) will address social risks due to potential social legacy issues stemming from previous AED operations, and the extensive social displacement generated by the 2022 floods.

This policy is triggered because the command areas that will be benefited from the project intervention rely on three Barrages on the main course of the Indus River to divert water from the river into main canals: Guddu, Sukkur and Kotri Barrages. These Barrages have a low height (less than 10 meters raising of the water level), but their length (1 to 2 kilometres) and the high flood discharges they allow to transfer downstream (between 25,000 m<sup>3</sup>/s and 37,000 m<sup>3</sup>/s) make them fall under the category of large dams. The Akram Wah canal to be rehabilitated under the project is abstracting water upstream of Kotri Barrage, and the project will finance the modernization of distributary and minor canals in the command area of three AWB, which are each abstracting water from one of the three Barrages.

Safety of Dams OP/BP 4.37

Yes



		<p>Another World Bank-funded project (SBIP, P131324) is currently financing rehabilitation and improvement works on Guddu and Sukkur Barrages. Improved O&amp;M and dam safety plans were already established and will be further improved for these two Barrages, while a preliminary safety assessment was conducted and will be upgraded for Kotri Barrage. A Dam Safety Panel is mobilized under SBIP financing and is actively involved in the oversight of the safety aspects of the Guddu and Sukkur Barrages, which may be extended to the safety review of the Kotri Barrage.</p>
Projects on International Waterways OP/BP 7.50	Yes	<p>This policy is triggered since the project activities rely on the water from the Indus River, which is an international waterway. Project activities will be limited to renovation of existing irrigation facilities to improve agriculture water productivity and 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 the other riparians' possible water use. Therefore, the project 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. In addition, according to Article VII of the Indus Waters Treaty of 1960 between India and Pakistan, the World Bank has concluded that a notification by Pakistan to India under paragraph (2) of the said Article is not required, as the project will not cause interference with the waters of any of the Rivers and will not materially affect the other riparians.</p>
Projects in Disputed Areas OP/BP 7.60	No	<p>The project is not located in a disputed territory. Therefore, this policy is not triggered.</p>



## KEY SAFEGUARD POLICY ISSUES AND THEIR MANAGEMENT

### A. Summary of Key Safeguard Issues

1. Describe any safeguard issues and impacts associated with the proposed project. Identify and describe any potential large scale, significant and/or irreversible impacts:

In general, Component 1 activities such as introducing policy reforms in water resources management, preparation of the Sindh Strategic Water Plan (SSWP), and improving the water pricing system are expected to have significant positive environmental and social impacts. Component 2 activities such as rehabilitation of the 116 km long Akram Wah canal and studies for rehabilitation of main canals on the Right Bank of the Indus Rivers (which may be implemented in future projects) are expected to have significant adverse environmental and social impacts due to large-scale civil works and resettlement. Modernization of minor irrigation and drainage at the FO level under Component 2.1 and at the WCA level under Component 3.1 are expected to have low to moderate negative environmental and social impacts. Component 3.2 and Component 5 Ag-FERC will entail the risks related to inappropriate fertilizer and other agrochemicals use, potential land conversion and grazing but those risks are small scale and localized.

The proposed Akram Wah canal rehabilitation works will be mainly carried out within the existing right of way. The most direct and significant adverse environmental impacts of the subproject will be on the natural landscape caused by the development of borrow areas to source 22 million cubic feet (0.63 million m<sup>3</sup>) for the strengthening of the canal embankment and disposal of about 129 million cubic feet (3.6 million m<sup>3</sup>) spoils generated from the canal excavation, and acquisition of small amounts of permanent land acquisition for the realignment of off-taking canals and temporary land acquisition for construction of temporary diversion channel). Adverse environmental impacts associated with the construction are mostly temporary and will mainly include waste generation, dust pollution, occupational health and safety risks and community exposure to work hazards. The Akram Wah subproject will directly benefit 187,000 hectares and 92,000 farming households in the command area by improving irrigation water supply efficiency and reliability. It will also help ensure a reliable raw water supply for towns and cities that draw upon the canal, including Hyderabad, with a population of around 2 million.

In early 2021, while preparation of SWAT was ongoing, the Sindh High Court mandated that the Irrigation Department undertake an Anti-Encroach Drive (AED) for all its property throughout the province, including clearing the right-of-way (RoW) of the Akram Wah canal. There were a total of 1,246 household affected, with more than 90% experiencing significant impacts. Most of the AED affected households were poor, informal settlers who were displaced from their homes. To address these legacy issues, SIDA prepared the Social Management and Resettlement Plan which will: i) ensure full replacement of lost assets and provide an opportunity for AED affected households to improve their standard of living; and ii) pilot an approach to allowing AED affected households back on to the RoW in accordance with an Irrigation Department policy that was adopted in mid-2022. The SMRP was developed in compliance with OP4.12 and consistent with ESS 5.

Under FERC component, the activity will not have major environmental and social safeguards risks. The component will stimulate a range of farm activities including land preparation and use of seeds, fertilizer, or other agro-chemicals. In view of the situation, it is anticipated that most of the resources will be used for seeds and fertilizers to start the cropping season. However, there would be potential limited site specific impacts including unequal benefit sharing if targeting is not equitable or in accordance to an acceptable beneficiary identification, over usage and/or unsafe handling, storage and disposal of fertilizes and other agro-chemicals, land conversion and excessive grazing. To



mitigate those risks and impacts, an ESMP for the FERC component was prepared and included in ESMF. Key mitigation measures proposed in ESMP includes: 1) agreement with farmers to ensure integrated pest management, protection of water courses from the use of fertilizer and other agro-chemicals, avoiding land conversion, no encroachment on the public land and grazing only at existing designated locations, 2) awareness raising campaigns to inform farmers about appropriate use (timing, dosage, method) and safe handling of inputs, 3) transparent targeting and beneficiaries' selection, and 4) robust Grievance Redress Mechanism (GRM) system to identify and address complaints. With implementation of FERC ESMP, no significant impacts are expected under FERC.

2. Describe any potential indirect and/or long term impacts due to anticipated future activities in the project area: Preliminary identification of Valued Environmental and Social Components (VECs), and an assessment of potential cumulative impacts contributed by the project was made in ESMF. The most important VECs relevant to the SWAT are i) surface water resources; ii) groundwater resources; iii) wetlands including Manchar Lake; iv) the Indus Delta; and v) the dryland areas. The ESMF concluded that the project will not negatively affect these VECs but rather potentially contribute to their improvement.

Component 1 will contribute to the protection of the VECs through various channels. Policy and institutional reforms will create the new legal basis for integrated water resources management and will restructure current institutions (Irrigation Department and SIDA) into an Irrigation and Water Resources Department, thus broadening the remit of these institutions to address water resources management and multifunctionality. The Sindh Strategic Water Plan will undertake a province-wide cumulative impact assessment and the stakeholder engagement process will address priority concerns such as water productivity, (reduced) water logging and salinity, water quality, safe sourcing of urban and rural water supply, effluent control, groundwater management and flood/drought management as well as environmental flow to the downstream.

Component 2 will improve the delivery of canal water services to enhance the agricultural water productivity and to improve overall water resources management. The renovation of Akram Wah will improve the integrated water resource management of the canal system, including the secure water supplies to the cities and the fresh groundwater lenses adjacent to the canal while construction related environmental and social impacts would be expected for the short term. The right bank studies will develop and lead to a comprehensive plan of action dealing with irrigation, drainage, wetland protection, water resource management and delivery of multifunctional services (including drinking water) on the Right Bank.

Component 3 will help enhance sustainable water resources management by improving on-farm water management, and promote the shift to high value, water thrifty crops through piloting a smart subsidy scheme, strengthening agricultural research and technology, and value chain development. This will help address water scarcity, as well as water logging and water salinity problems thus improving both surface water, groundwater, and overall future condition of identified VECs.

3. Describe any project alternatives (if relevant) considered to help avoid or minimize adverse impacts.

The current condition of the Akram Wah is very poor with the damaged embankment and canal linings and aged structures. Hence without works to replace and rehabilitate the infrastructure, the efficiency, reliability and equity of irrigation water distribution from this canal will continue to deteriorate. A number of options for rehabilitation were studied during the feasibility study, which includes the lining of canals only on areas where the seepage losses appear to be a real issue, the full lining of the canal, widening of the canal, and construction of retaining wall. Based on technical, economic, environmental and land acquisition criteria, a combination of these options has been adopted. The existing failed liner will be removed (currently extends RD 193.8). Retaining walls have been adopted through



congested sections in Hyderabad, where additional land acquisition is not feasible. Downstream of Hyderabad, the canal will be reprofiled as an unlined earthen canal. Works from RD 193.8 to the tail will primarily consist of raising and strengthening canal embankments and berm formation where necessary.

4. Describe measures taken by the borrower to address safeguard policy issues. Provide an assessment of borrower capacity to plan and implement the measures described.

All the PIUs have existing environmental and social staff who have extensive experience with Bank-financed projects. The PCMU has a Deputy Director for Environment and a Deputy Director for Social. SIDA has an Environmental Management Unit (EMU) with six specialists, a Deputy Director, an Environmental Specialist, an Ecologist, a sociologist and two Environmental Inspectors. The ADU/PIU has only one Environmental and Social Safeguards Specialist who has worked for SAGP and continues working for SWAT. The ADU/PIU will hire two additional staff - a junior environmental specialist and a junior social specialist, to support the existing safeguard specialist. After completion of the project, AWBs will be responsible for the management of canal infrastructure. Currently, there are no safeguard specialists in the AWB teams, and the Project will support the hiring of a social specialist in each AWB. Each PIU will also contract project implementation consultants (PICs), which will help implement its specific component. Each PIC will appoint dedicated environmental, social, health and safety (ESHS) staff to ensure the implementation of ESMF and subproject-specific ESAs/ESMPs. PIC staff will include an Environmental specialist, an Occupational Health and Safety Specialist, an Ecologist, Social Specialist, and ESHS site Inspectors.

The step-by-step procedure to be followed during the environmental and social assessment of the proposed subprojects, from screening to the preparation of ESAs/ESMPs and their implementation, are given in ESMF. The ESMF includes E&S screening, mitigation measures, institutional arrangements, and budget. The ESMF also contains an ESMP annex for the FERC. Capacity building programs will be conducted for all the Program staff, including engineers and relevant stakeholders, during the initial stages of the Program to sensitize them on the management of environmental and social issues and to build the requisite capacities. An Independent Resettlement Consultant who would be providing support in the implementation of the RPF/RAP.

The proposed training plan is given in ESMF. PIUs will deliver the training programs through its E&S staff and hiring a training consultant. At the construction site, PICs will take the lead in implementing the capacity building plan, though the contractors will also be responsible for conducting training for their own staff and workers. The various aspects that are covered under the capacity building will include general environmental and social awareness, key environmental and social sensitivities of the area, key environmental and social impacts of the project, ESMP requirements, OHS aspects, and waste disposal. PCMU may revise the plan during the project implementation as required.

5. Identify the key stakeholders and describe the mechanisms for consultation and disclosure on safeguard policies, with an emphasis on potentially affected people.

Stakeholder Engagement Plan (SEP) was developed during project preparation and annexed in ESMF. SEP identified different types of stakeholders, namely Affected Parties, Other Interested Parties and Disadvantaged and Vulnerable Groups. SEP also include the stakeholder engagement approaches throughout the project cycle. SEP is a living document and will need to be updated and refined throughout the lifecycle of the Project. A continued process of stakeholder engagement with PAPs and other stakeholders will be followed to ensure transparency in the implementation of ESMP and RAP and to keep the PAPs and other stakeholders informed. Stakeholder engagement will assist in obtaining cooperation from informed PAPs and other stakeholders, to avoid cost and time in dealing with complaints and grievances. While the SEP is not a requirement under the safeguards polices, the project recognized



the value addition of having the SEP and of ensuring that it is also consistent with ESS 5. A grievance redressal mechanism (GRM) has been developed. The aim of the grievance mechanism is to achieve a mutually agreed resolution of grievances raised by such stakeholders. The grievance mechanism is described in ESMF as well as RPF in detail.

**B. Disclosure Requirements****Environmental Assessment/Audit/Management Plan/Other**

Date of receipt by the Bank	Date of submission for disclosure	For category A projects, date of distributing the Executive Summary of the EA to the Executive Directors
31-Dec-2021	07-Nov-2022	03-May-2022

**"In country" Disclosure**

Pakistan  
07-Nov-2022

**Comments**

The following documents have disclosed on the Borrowers website: <http://sida.org.pk/pages.aspx?id=106>

ESMF (English) and ESMF Executive Summary (English, Urdu, Sindhi)  
Akram Wah ESIA (English) and Executive Summary (English, Urdu, Sindhi).

**Resettlement Action Plan/Framework/Policy Process**

Date of receipt by the Bank	Date of submission for disclosure
01-Sep-2022	07-Nov-2022

**"In country" Disclosure**

Pakistan  
07-Nov-2022

**Comments**

The following documents have disclosed on the Borrowers website: <http://sida.org.pk/pages.aspx?id=106>

Akram Wah Social Management and Resettlement Plan  
SWAT Resettlement Policy Framework

**Pest Management Plan**

Was the document disclosed prior to appraisal?	Date of receipt by the Bank	Date of submission for disclosure



NA

**"In country" Disclosure**

Pakistan

12-Aug-2021

Comments

IPM measures are proposed as part of ESMF.

If the project triggers the Pest Management and/or Physical Cultural Resources policies, the respective issues are to be addressed and disclosed as part of the Environmental Assessment/Audit/or EMP.

If in-country disclosure of any of the above documents is not expected, please explain why:

**C. Compliance Monitoring Indicators at the Corporate Level (to be filled in when the ISDS is finalized by the project decision meeting)****OP/BP/GP 4.01 - Environment Assessment**

Does the project require a stand-alone EA (including EMP) report?

Yes

If yes, then did the Regional Environment Unit or Practice Manager (PM) review and approve the EA report?

Yes

Are the cost and the accountabilities for the EMP incorporated in the credit/loan?

Yes

**OP/BP 4.04 - Natural Habitats**

Would the project result in any significant conversion or degradation of critical natural habitats?

No

If the project would result in significant conversion or degradation of other (non-critical) natural habitats, does the project include mitigation measures acceptable to the Bank?

NA

**OP 4.09 - Pest Management**

Does the EA adequately address the pest management issues?

Yes

Is a separate PMP required?

No



If yes, has the PMP been reviewed and approved by a safeguards specialist or PM? Are PMP requirements included in project design? If yes, does the project team include a Pest Management Specialist?

NA

**OP/BP 4.11 - Physical Cultural Resources**

Does the EA include adequate measures related to cultural property?

Yes

Does the credit/loan incorporate mechanisms to mitigate the potential adverse impacts on cultural property?

Yes

**OP/BP 4.12 - Involuntary Resettlement**

Has a resettlement plan/abbreviated plan/policy framework/process framework (as appropriate) been prepared?

Yes

If yes, then did the Regional unit responsible for safeguards or Practice Manager review the plan?

Yes

**OP/BP 4.37 - Safety of Dams**

Have dam safety plans been prepared?

Yes

Have the TORs as well as composition for the independent Panel of Experts (POE) been reviewed and approved by the Bank?

Yes

Has an Emergency Preparedness Plan (EPP) been prepared and arrangements been made for public awareness and training?

Yes

**OP 7.50 - Projects on International Waterways**

Have the other riparians been notified of the project?

NA

If the project falls under one of the exceptions to the notification requirement, has this been cleared with the Legal Department, and the memo to the RVP prepared and sent?

Yes

Has the RVP approved such an exception?

Yes

**The World Bank Policy on Disclosure of Information**

Have relevant safeguard policies documents been sent to the World Bank for disclosure?

Yes



Have relevant documents been disclosed in-country in a public place in a form and language that are understandable and accessible to project-affected groups and local NGOs?

Yes

#### All Safeguard Policies

Have satisfactory calendar, budget and clear institutional responsibilities been prepared for the implementation of measures related to safeguard policies?

Yes

Have costs related to safeguard policy measures been included in the project cost?

Yes

Does the Monitoring and Evaluation system of the project include the monitoring of safeguard impacts and measures related to safeguard policies?

Yes

Have satisfactory implementation arrangements been agreed with the borrower and the same been adequately reflected in the project legal documents?

Yes

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#### APPROVAL

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