I. Country and Sector Background

1. *The Indus Basin Irrigation System.* Irrigation and drainage are crucial to Pakistan’s irrigated agriculture, which is the backbone of the economy. Around 80% of arable lands and 90% of agricultural output (25% of GDP) are entirely dependent on irrigation. The Indus Basin Irrigation System (IBIS) is the largest integrated irrigation network in the world, consisting of Indus river and its tributaries, three major storage reservoirs, 19 barrages, 12 inter-river link canals, 43 irrigation canal commands, and over 110,000 watercourses, delivering water to farms. Practically the entire system is unlined, resulting in seepage and operational losses. The losses are particularly high from watercourses. In saline groundwater areas, these losses are generally irretrievable. Sindh has the major barrages on the Indus River that divert approximately 55.5 to 59.25 billion cubic meters of water annually to the 14 main canal commands. There are about 42,000 watercourses (tertiary channels) in Sindh. So far, 17,000 watercourses have been improved/lined under various on-farm water management programs, including SOFWMP.

2. *Drainage System.* Around 78% of the area in Sindh province is underlain by saline groundwater, which is unsuitable for irrigation. Surface and sub-surface drainage systems are inadequate resulting in much of the drainage affluent being either retained in the basin or disposed into rivers and canals. Due to inadequate drainage cover, nearly one-fifth of the canal command areas have been affected by water logging and salinity.

3. *Land and Agriculture.* Sindh has a total population of 35 million, almost half of which lives in rural areas. The total geographical area is 14 million ha, constituting 17.5 percent of Pakistan. About 5.7 million ha is commanded by canals. Net area sown is about 3
million ha, with about 1 million ha sown twice a year. Over 93% of the farms are small (<7 ha) and represent 64% of the total farm area. Large farms (>7 ha) are only 7% in number but represent nearly 36% of the total farm area.

4. **Poverty in Sindh.** Poverty is pervasive and deep in rural Sindh. More than one-third of rural population lives below the poverty line. Over 70% of the rural population is landless. Recent Pakistan Rural Household Survey data shows that rural households, including the landless, derive close to 60% of their income from agriculture, directly or indirectly. The rural poor tend to be employed mostly as agriculture wage workers. The concentration of poor is the highest among categories of households where the head is an unpaid family worker, sharecropper, or owner-cultivator owning less than 2 hectares of land.

**Irrigation and Drainage Sector Issues**

5. Irrigation and drainage in Pakistan face major issues, many of them stemming from underlying institutional weaknesses. The major institutional issue is a near exclusive control of the irrigation and drainage system by public sector entities. Insufficient storage capacity and lack of control structures is another major constraint. Water availability in the Indus Basin Irrigation System is highly seasonal, with 85% of annual river flows occurring during the summer months of June to September, making storage imperative for the **Rabi** (winter) crop season. While the construction of three major reservoirs (Tarbela, Mangla, Chashma) has provided some flexibility in canal operations to meet irrigation water demand in the **Rabi** crop season, the reservoir capacity and its operation is inadequate. This, combined with the lack of control structures in the system, makes it difficult to manage the system on a "demand basis." Institutional weaknesses manifest in the form of: (i) low water delivery efficiency (only about 35-40% from the canal head to crop root zone); (ii) water distribution inequities; (iii) wasteful on-farm water use; (iv) waterlogging and salinity; and (v) poor O&M and low cost recovery. Sindh faces the same issues.

6. The current strategy of GOsindh has three inter-related elements: (a) fostering an institutional, policy and operational framework conducive to efficient and self-sustaining operation and management of the irrigation system; (b) supporting farmer organizations [e.g. Watercourse Associations (WCAs)] in implementing high payoff infrastructure improvements at an accelerated pace; and (c) enhancing agricultural productivity by introducing improved technology, agronomic practices, and information/knowledge systems.

**II. Objectives**

7. The main objectives of proposed activities under Additional Financing are to improve water resource management and enhance agricultural productivity in the project area through: (a) improving the efficiency, reliability, and equity of irrigation water distribution at watercourse levels; (b) supporting agricultural productivity enhancement measures to complement and enhance the benefits of improved water management; and (c) enhancing long-term financial sustainability of the irrigation system by fostering self-sustaining farmer organizations - Watercourse Associations - at the watercourse levels.

**III. Rationale for Bank Involvement**
8. The key rationales for additional financing are as follows:

a) **Potential for Maximizing Development Impacts in the Project Area and Reducing Fiscal Strain on National Program for Improvement of Watercourses (NPIW):**

   The watercourse improvement works completed under the SOFWMP and NPIW have already demonstrated the effectiveness of the intervention, especially in improving water supply and enhancing equitability of water distribution. The NPIW constitutes an essential complementary intervention to two other Bank-financed investment projects in Sindh Province, i.e. Water Sector Improvement Project (WSIP) and SOFWMP.\(^1\) By 2010, all watercourses in the project area were expected to be improved under the ongoing NPIW. However, due to current Government budget crisis, and subsequent drastic cuts in funding, the implementation of NPIW has slowed down sharply during FY 2008-09. The inability of NPIW to complete the planned watercourse improvement works in the project area may prevent realizing the full benefits of Bank’s two ongoing projects in Sindh. Providing additional financing to carry out the planned watercourse works in the project area would allow maximizing the overall development impacts of Bank-financed projects. Moreover, additional resources provided by the Bank for watercourse improvement in the project area would give the Government the opportunity to reallocate some of previously earmarked funds to watercourse improvement in the project area to other equally important areas of NPIW in the province, thereby reducing fiscal strains on the Government program.

b) **Positive Development Impacts and Implementation Period:** Preliminary impact assessment and observations from field visits suggest that the improved watercourses under the Project have made positive impacts in terms of enhanced and more equitable water supply and increased income by farmers, hence increasing the watercourse improvement activities would augment the positive development impacts of the Project. Based on Government implementation records of the past 3 years\(^2\), it was assessed that the proposed Additional Financing (for improving approximately 2,500 watercourses) in the project area would be utilized in less than 3 years as required in Bank’s operational policy.

c) **Government Commitment and Ease of Scaling-Up:** Both federal and provincial governments are fully committed to watercourse improvement interventions. In the wake of current fiscal crisis, the Federal Government has re-prioritized and streamlined its portfolio of ongoing and new projects and discontinued many programs, which are considered to be of lower priority. However, NPIW is still on Government’s list of high priority programs and the Government is committed to complete it. During the past five years, the Government has accumulated considerable experience in implementing watercourse improvement works and has

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\(^1\) While Bank’s two ongoing projects are largely focused on improving main and branch canals, distributaries, and minors, NPIW activities are focused on watercourse improvements and this complementarity would allow comprehensive rehabilitation of the entire irrigation network in the project area starting from main and branch canals, through to distributaries and minors, and to watercourses, thus maximizing the overall benefits from investments.

\(^2\) During the past three years (2005/06-2007/08), the Government of Sindh has been able to complete around 4,500 watercourses per year and all existing capacities are still in place.
established effective and well-tested implementation mechanisms for the program. The entire institutional set-up and technical infrastructure of NPIW (including technical advisory, social mobilization and monitoring field teams) used for watercourse improvement works completed under the Project, are still in place and can be readily deployed for scaling-up activities. This will greatly facilitate the implementation process.

IV. Description

9. The individual components of the proposed additional financing are summarized below:

a) **Watercourse Improvement Component.** Under this component, around 2,500 watercourses, comprising earthen improvements, lining, installation of *pucca nuccas* (concrete turnouts) and culverts, will be improved. Also, under this component, a series of social mobilization and capacity building activities directed at WCAs will be carried out. The project will supplement the ongoing institutional development and policy reform efforts of the GoSindh by establishing and/or strengthening 2,500 WCAs and building their capacities. The WCAs would be involved in planning, designing, and implementation of watercourse improvement works as well as in operation and maintenance of improved watercourses.

b) **Productivity Enhancement Component.** This component comprises the precise leveling of 11,000 ha of farm land using laser guided equipment; development and dissemination of improved seeds, demonstration on tunnel farming for high value crops, training of farmers in improved water management and agricultural practices and new technology; and integrated pest management (IPM), monitoring pesticide residue effects on crops, information systems, and market/marketing.

c) **Project Management Support Component.** It includes, *inter alia*, technical assistance for project launch, supervision (quality assurance), mid-term review, development of a project management information system, productivity enhancement, preparation of and assistance in implementing a training and capacity building program for project staff, and WCAs. Monitoring and Evaluation will be an important part of Project Management Support, which will include design and implementation of a monitoring and evaluation system and establishment of a spatial GIS database. The M&E system would provide continuous feedback to project management on the project performance and assess its physical, agricultural, social, financial/fiscal, environmental and economic impact, so that, corrective actions could be taken in a timely manner.

V. Financing

<table>
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<tr>
<th>Source:</th>
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<tr>
<td>BORROWER/RECIPIENT</td>
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<tr>
<td>International Development Association (IDA)</td>
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<tr>
<td>Local Farmer Organizations</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>61.7</strong></td>
</tr>
</tbody>
</table>

VI. Implementation
10. The Agriculture Department, represented by DGAEWM, would be the Implementing Agency for the project. DGAEWM would be responsible for social mobilization for establishing WCAs, providing technical assistance, and contracting with WCAs, for watercourse improvement works, and productivity enhancement activities in collaboration with the Directorates General of Agricultural Extension and Research. District government staff, responsible on-farm water management programs, will work under the overall coordination and technical supervision of DGAEWM. The DGAEWM will hire additional staff to supplement the existing capacity of the District-based staff.

11. WCAs would enter into “output-based” agreements with DGAEWM for improvement of watercourses, execute watercourse improvement civil works, assist FOs in *abiana* collection, operate and maintain watercourses, and participate in productivity enhancement activities.

VII. Sustainability

12. The ongoing institutional reforms in Sindh involve self-sustaining Area Water Boards, promoting beneficiary ownership, and O&M of the system through formally organized and empowered FOs. The proposed additional financing will complement these reforms and provide solid foundation for them by establishing and strengthening WCAs, building their capacity; supporting high pay-off investments on watercourses, as well as productivity enhancement measures. This would help create an enabling environment for physical, institutional and financial sustainability of Sindh’s irrigation and drainage system.

VIII. Lessons Learned from Past Operations in the Country/Sector

13. The project takes into account important lessons learned from Bank’s involvement in Pakistan’s irrigation and drainage sector in Sindh, Punjab and NWFP and also from NPIW. Key lessons incorporated in the design are farmer participation in irrigation management is of central importance for long term sustainability of the irrigation system. Social mobilization and capacity building are key to developing sustainable WCAs, and empowering them to carry out their functions is essential to making them effective.

14. Investments to make the irrigation infrastructure functional and efficient are essential to enable WCAs and other water management institutions upstream to perform and achieve intended outcomes. Under the project, WCAs would be expected to participate in planning, designing, and implementing the rehabilitation works and also would contribute towards the capital cost of watercourse improvements. This would increase ownership of project by WCAs.

15. Productivity enhancement measures should supplement improvement water management in order to reap the full benefits of improved water management and equity of water distribution. Accordingly, a series of productivity enhancing activities including development and multiplication of improved seeds, promotion of high value agriculture through tunnel farming, laser land leveling, information dissemination among farmers through local radio programs, information kiosks, and websites.

16. Specific lessons learned from NPIW are that a high-level of political commitment and strong government ownership at provincial levels; effective field teams, simple fund flow, and measurement and payment arrangements and direct involvement of beneficiaries in identifying and implementing the actual contracts are essential factors for successful project implementation.
The proposed project under Additional Financing incorporated these factors in its design, and will be implemented under NPIW’s existing network.

IX. Safeguard Policies (including public consultation)

<table>
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<th>Safeguard Policies Triggered by the Project</th>
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X. List of Factual Technical Documents

XI. Contact point

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*By supporting the proposed project, the Bank does not intend to prejudice the final determination of the parties' claims on the disputed areas.*