

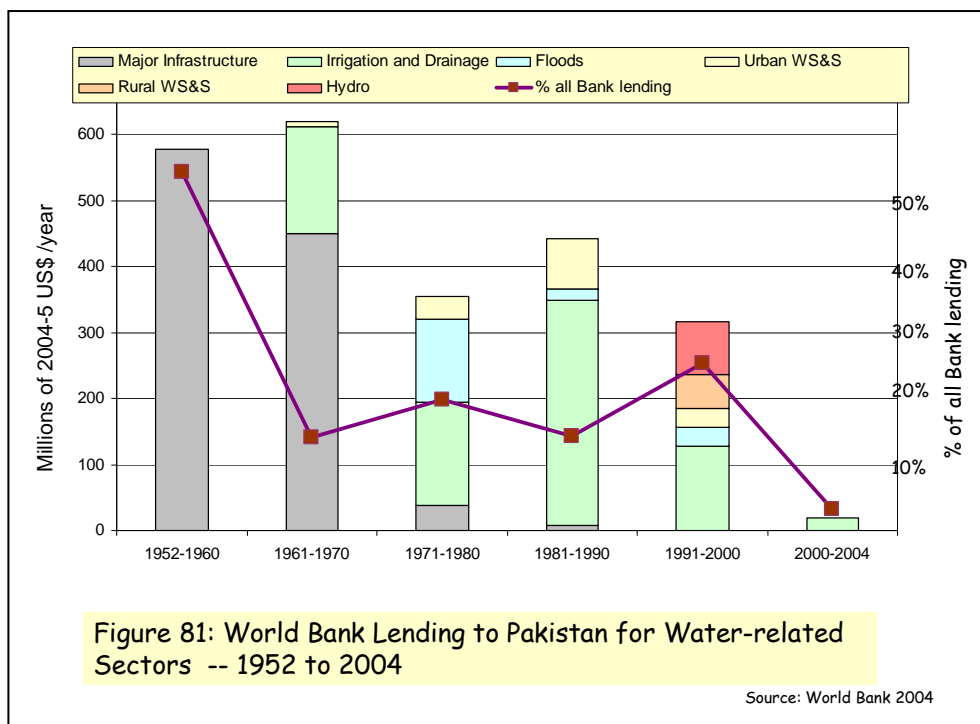
VI: THE EVOLVING ROLE OF THE WORLD BANK

What the Bank has done in the past

Water Resources and Irrigation¹⁷⁴

The World Bank has played a central role in the development of Pakistan's Indus Basin Irrigation System, the largest integrated irrigation network in the world. The Bank's partnership with Pakistan in the water sector dates back to 1952 when the first loan was approved for a water project in the then East Pakistan. In the 1950s, the Bank's good offices were instrumental in the successful negotiations of the Indus Waters Treaty (1960) between Pakistan and India, which settled the division of the waters of Indus Basin between the two countries following Partition in 1947. After the signing of the Indus Waters Treaty, the Bank helped to mobilize funds and administered the Indus Basin Development Fund (IBDF) during 1960-1967, which financed the physical works to implement the Treaty provisions, also known as the Indus Basin Development Project (IBDP). Subsequently, from 1968 onward the Bank administered the Tarbela Development Fund (TDF), which was extended to the post-Tarbela construction period during which extensive remedial works were implemented after the first impounding of the Tarbela reservoir. Thereafter, the Bank played a catalytic role in periodic major reviews of the irrigation and power strategy and funded parts of the resulting investment programs.

Altogether, the Bank has, so far, supported 40 operations in the irrigation, drainage and water resources development with thirty six¹⁷⁵ IDA Credits (US\$ 13,455 million in 2005 prices) and four IBRD loans (US\$ 5,807 million). During this period, these operations constituted 16.5% of the total Bank lending to Pakistan. The background paper by Usman Qamar¹⁷⁶ includes a complete list of Bank operations in the water sector and the sub-sectoral composition of its water sector portfolio since 1952. As shown in Figure 81, annual lending for water-related projects has varied between \$620 million a year in the period 1960-1970, to a low of \$20 million a year in the most recent period (2001-2004).



In addition to financing specific investments, the Bank also supported Economic and Sector Work (ESW) and provided Analytical and Advisory Assistance (AAA) that culminated in several major sector reports, including: Water and Power Resources of West Pakistan: A Study in Sector Planning: (popularly know as the Lieftinck Report 1967); Revised Action Program (RAP) for Irrigated Agriculture (1979); the Water Sector Investment Planning Study (1991); Pakistan -- Irrigation and Drainage: Issues and Options (1994); and Accelerated Development of Water Resources and Irrigated Agriculture, prepared as part of the Public Expenditure Review carried out in 2003. In addition, several sector policy and planning studies, including a draft National Water Policy, 2002 and a framework for a Drainage Master Plan for the country were prepared through the technical assistance components of Bank-assisted projects as well as various Trust Funds managed by the Bank, including the Bank-Netherlands Water Partnership Program.

The evolution of the water sector in Pakistan, and the Bank’s lending and non-lending assistance can broadly be divided into the following somewhat overlapping times periods.

1960 – 1975 -- the Post-Indus Waters Treaty Period

Prior to 1960, Bank’s involvement in the sector was limited to seven projects in the then East Pakistan for irrigation, flood rehabilitation and water supply for a total amount of US\$ 3,832 million equivalent (current prices). Following the Indus Waters Treaty, the focus of investments and the emphasis of Bank assistance was on meeting the water requirements of areas that were earlier served by the eastern tributaries of the Indus River (Ravi, Beas, and Sutlej) whose waters were allocated to India as part of the Indus Waters Treaty. This was imperative to avoid a food grain crisis that could seriously harm the new nation. The 1960s saw the construction of major IBDP works, including the Mangla dam and a network of barrages and inter-river link canals and subsequently the Tarbela dam. It is worth noting that the Bank did not do an economic analysis of Mangla, because construction of the dam was deemed to be essential for the survival of the country. Besides its role as the Administrator of IBDF¹⁷⁷, the Bank supported the IBDP through two IBRD loans and one IDA credit (see Table-1). The “twin menaces” of salinity and water logging and the need to provide drainage in many parts of the Indus plain were also recognized at this time. In response to these strategic threats, a public program using tube wells and surface drains was launched to lower the water table and reclaim saline soils. The 1960s witnessed the beginning of the Salinity Control and Reclamation Program (SCARP). The Bank supported this program through two IDA credits.

Table-2: Bank Assistance During 1960-1970

<i>Sr. #</i>	<i>Financing</i>	<i>Description</i>	<i>Amount US \$ (Current)</i>	<i>Amount US \$ (2004/05)</i>	<i>Approval Date</i>
1	IBRD	The Indus Basin Project	90,000,000	4,617,000,000	13-Sep-60
2	IDA	Khairpur Irrigation	21,154,434	1,085,222,464	29-Jun-62
3	IDA	Indus Basin Project	70,619,397	3,530,969,850	16-Jul-64
4	IBRD	Tarbela Dam Project	25,000,000	977,500,000	2-Jul-68
5	IDA	Khairpur Irrigation & Drainage	14,000,000	519,400,000	23-Jun-70
Total			220,773,831	10,730,092,314	

The 1960s might be termed the “heyday” of the water sector in Pakistan when massive investments in the sector coupled with the introduction of high yielding varieties (HYV) of wheat heralded the “green revolution”. Agricultural growth, which was sluggish in the 1950s (about 1.4%) and less than half the population growth rate, became the key engine of overall economic growth, and there was no major food grain crisis. This enormous achievement was fruit of the following two major initiatives:

- From the late 1960s through 1975 river diversion capacity was expanded from 67 Million Acre Feet (MAF) at independence to an annual average of nearly 104 MAF today; the Indus Replacement Works, foreseen in the Indus Treaty signed with India in 1960, including the Mangla Dam were completed and the Tarbela Dam was also constructed. This investment program expanded the Indus basin irrigation system, increased hydropower generation capacity, and increased cropping intensity on the Indus plain; and.
- Despite under-investment in research and development, pricing and subsidy policies set the stage for the introduction of improved and high yielding varieties of seed from the late 1960s as both fertilizer and irrigation water availability expanded (the “green revolution”) – From 1970 to 1994/95 the value of wheat production, the staple crop, nearly doubled from 6.476 Mt in 1970-71 to 17.002 Mt in 1994-95.

The timely completion of the mega IBDP is acknowledged as a major feat of efficient project management by Pakistan, international cooperation and best practices. The Indus Basin Project Completion Note (May 1993) stated that:

“The Indus Basin Works have fulfilled their basic replacement objective (arising from the diversion of water to India) and provided a small increment of water; that the growth in water supply, especially through tube wells, had a significant impact on agricultural production; and that the increase in power supply had been very cost effective.”

Similarly, the Tarbela Dam Project Completion Report (1984) concluded that:

“the entire Indus Basin Project stands as a monument to international cooperative effort, in a large part guided by the Bank. The immense system of replacement works consisting of Tarbela dam, six barrages and eight link canals was constructed during the period 1961-68 – two years ahead of the Treaty deadline... No other project of such size and complexity had been constructed in such record time.”

While the IBDP was a success on most accounts, the Tarbela PCR and OED’s Project Performance Audit Report (PPAR) highlight some aspects that should have received more attention during the planning stages:

- Tarbela dam, the last of the IBDP works, was more than a Replacement Work, as additional water supplies were expected to become available. However, during the planning stage it was unclear as to how this additional water would be integrated in the national irrigation system for best use. Revised water allocation (water rights) among provinces and canal commands were not in place¹⁷⁸.
- Complementary investments in agricultural development¹⁷⁹ did not receive adequate attention;
- The development of institutional capacity to conduct research and training in Pakistan on water resources engineering and management was not an important area of Bank concern; and
- The immense effort represented by the IBDP and Tarbela programs inevitably absorbed the major proportion of external aid as well as significant amounts of domestic resources. It also tended to divert attention away from downstream problems associated with the operation of Pakistan's enormous network of irrigation facilities and lack of adequate drainage

infrastructure. As a consequence, over time, the water table underlying the Indus plain rose, leading to serious problems of water logging and soil salinity in certain areas.

The Post-IBDP Period (1975-1993)

This period can be sub-divided into two overlapping time frames:

- 1975-1985: Emphasis on addressing water logging and salinity problems through a Salinity Control and Reclamation Program (SCARP) and integrated irrigation and drainage interventions (the concern of sustainability of irrigated agriculture was the main driver), and
- 1979-1993: Implementation of the Revised Action Program (RAP) for Irrigated Agriculture -- emphasis on system rehabilitation, water conservation, improved management, farmer participation, and sustainability (improved O&M and cost recovery through privatization of public tube wells: “ the SCARP Transition program”)

With the expected completion of IBDP and Tarbela dam in the mid-1970s, GoP shifted emphasis to resolving water logging and salinity problems, and in 1973, launched an “accelerated program” of water logging and salinity control (SCARP Program), building upon the success of the program of vertical drainage (through tubewells) and surface drains, started in the 1960 (e.g. SCARP I). Planning studies undertaken in the 1960s reinforced this approach, identified additional areas suitable for SCARP projects, proposed a major system of surface drains to dispose off saline effluent, and emphasized irrigation benefits that could be obtained from canal remodelling and from SCARP tube wells in fresh groundwater areas. SCARPs attempted to lower groundwater levels through tubewell pumping and, to a limited extent, through tile drainage. Pumping from fresh water aquifers provided an additional source of irrigation water and enabled leaching of salts from saline soils. Over 12,000 public tube wells were installed and the program was generally successful in controlling water logging while supplementing irrigation supplies.

The SCARP Program, however, had its own problems. Its comprehensive approach to area development and emphasis on construction through WAPDA, tended unintentionally to divert attention away from water management, on-farm development, and related issues. Financial and other constraints slowed implementation, and establishment of large public sector tubewell fields placed an on-going financial burden on operating agencies (provincial Irrigation Departments) that seriously restricted funds available for normal maintenance of the surface distribution and drainage system. In addition, this program had technical and operational problems. Tubewell life was less than planned (10-15 years instead of the assumed 30-40 years) and because of plugging of screens and gravel packs, the capacity of most tubewells decreased about 5 percent annually. Water tables were lowered and irrigation supplies supplemented, but efficient management of public tube wells proved elusive.

Furthermore, the addition of Tarbela water, while significantly increasing dry season cropping, tended to aggravate waterlogging problems in certain areas and brought into focus concerns about overall efficiencies in the use of irrigation supplies. These concerns were heightened further by the demonstration under a USAID-funded research project that water losses in the system, especially at the watercourse level, were significantly higher than had been previously assumed.

The RAP for Irrigated Agriculture (1979)

Increasingly during the 1970s, it was recognized that a more direct approach to the problems of management, maintenance, and efficiency in the operation of Pakistan's irrigation system was required, and further, that such an approach would need to be more closely attuned to the immediate constraints on agricultural production than in the past. Low *abiana* recoveries¹⁸⁰, rising SCARP O&M costs, inflation and pay commission awards resulted in major neglect of the surface irrigation system. Deferred maintenance began to accumulate and institutional weaknesses, manifested by poor quality of service delivery, also began to become apparent. By early 1980s, accumulated deferred maintenance of the irrigation system had reached unsustainable levels. To help evolve appropriate policies and

programs to implement such a new strategy to address emerging issues, a UNDP-financed and World Bank-executed study was mounted to prepare a RAP for irrigated agriculture.

While recognizing that programs to increase availability of water and other inputs will continue to be important, the RAP recommended in 1979 that greater priority be given to complementary measures designed to ensure efficient water use, in particular through farm-level programs and mobilization of private initiative and capital. The RAP also recommended better coordination between agriculture and water policies, improved water management at the farm and command area levels, discontinuation of new public investments in fresh ground water areas and privatization of public tube wells, and system rehabilitation. Recognition was given to the capacity of the farmer to respond to appropriate incentives as well as to the need to generate additional resources in both the public and private sectors to relieve acute resource constraints facing Pakistan.

Specifically, the RAP recommended: (a) investment policies that emphasized quick returns and that complemented existing facilities rather than expansion of irrigated area (rehabilitation, on-farm and watercourse improvements, essential drainage, and agricultural support services); (b) management policies that transferred relevant activities to the private sector (e.g., tubewell development in fresh groundwater areas) and that strengthened GoP operating agencies; and (c) pricing policies that recognized continuing resource constraints and the need to provide appropriate efficiency signals to the private sector. The RAP recommendations in large measure were accepted by GoP and made part of the National Agricultural Policy in 1980.

Bank Assistance: During the 1970s, Bank assistance was devoted to completing the Tarbela dam including the remedial works that required special attention. In addition, the Bank approved three drainage projects and a flood damage restoration project.

Table-3: Bank Assistance During 1971-1980

<i>Sr. #</i>	<i>Financier</i>	<i>Description</i>	<i>Amount US \$ (Current)</i>	<i>Amount US \$ (2004/05)</i>	<i>Approval Date</i>
1	IDA	Flood Rehabilitation project	35,000,000	787,500,000	12-Mar-74
2	IDA	Khairpur-II Irrigation & Drainage Project	14,000,000	182,000,000	24-Jun-76
3	IDA	Flood Damage Restoration	40,000,000	460,000,000	22-Feb-77
4	IDA	SCARP-VI	70,000,000	763,000,000	6-Dec-77
5	IDA	Tarbela Dam Supplement II	35,000,000	381,500,000	28-Feb-78
6	IDA	SCARP Mardan	60,000,000	624,000,000	23-Jan-79
Total			254,000,000	3,198,000,000	

During the 1980s, Bank assistance focused on implementing the recommendations of the RAP. There was a sharp increase in Bank assistance both in terms of number of operations and amounts committed for the sector, involving twelve operations with a total commitment of US\$ 3.7 billion. Besides one operation for improved maintenance facilities for Tarbela, Mangla and Chashma Reservoirs, one flood damage restoration project, and one project for small irrigation schemes in Balochistan, the Bank supported drainage, on farm water management, system rehabilitation and privatization of SCARPs in fresh groundwater areas.

Table-4: Bank Assistance During 1981-1990

<i>Sr. #</i>	<i>Financier</i>	<i>Description</i>	<i>Amount US \$ (Current)</i>	<i>Amount US \$ (2004/05)</i>	<i>Approval Date</i>
1	IDA	On-Farm Water Management	41,000,000	323,900,000	16-Jun-81
2	IDA	Irrigation System Rehabilitation	40,000,000	316,000,000	4-May-82
3	IDA	Balochistan Minor Irrigation & Development.	14,000,000	110,600,000	11-May-82
4	IBRD	Reservoir Maintenance Facilities	10,200,000	74,460,000	15-Mar-83
5	IDA	Fourth Drainage Project	65,000,000	474,500,000	31-May-83
6	IDA	Command Water Management	46,500,000	320,850,000	29-May-84
7	IDA	Left Bank Outfall Drain – Stage I	150,000,000	1,005,000,000	13-Dec-84
8	IDA	On Farm Water Management II	34,500,000	231,150,000	6-Jun-85
9	IDA	SCARP Transition Pilot	10,000,000	63,000,000	8-May-86
10	IDA	Irrigation System Rehabilitation II	79,500,000	405,450,000	29-Mar-88
11	IDA	Private Tube well Development	34,400,000	184,000,000	11-Apr-89
12	IDA	Flood Damage Restoration	40,000,000	158,240,000	11-Apr-89
Total			565,100,000	3,667,150,000	

In the drainage sub-sector, three Bank assisted SCARPs (Mardan, Khairpur II, Panjnad Abassia) started in the early 1980s were completed. Further Bank assistance in drainage was focused on SGW areas and included one project in Punjab (Fourth Drainage) and one in Sindh (the Left Bank Outfall Drain, LBOD Stage-I). While the focus of all these projects was on providing drainage relief, they were designed as integrated irrigation and drainage investments that sought productivity improvements in reclaimed areas.

In water management, the Bank supported two OFWM Projects and a Command Water Management Project. These projects recognized the need for giving greater voice to farmers in decision making at the watercourse level. Supporting legislation in the form of Water User Association Acts was promulgated in all provinces.

In system rehabilitation, the Bank supported two successive nationwide projects to rehabilitate the irrigation and drainage system. At the same time, O&M funding was substantially increased with the help of grants from GoP and periodic increases in *abiana* charges were covenanted with the provinces. However, institutional and policy changes required to sustain O&M levels and improve O&M planning and effectiveness remained lacking.

The Bank also supported a program for “SCARP Transition” (disinvesting public tube wells in fresh groundwater areas) on a pilot basis in Punjab to reduce the public sector O&M burden¹⁸¹. A project to support private tubewell development in fresh groundwater areas, with shallow water tables, was supported to avoid the need for further SCARPs in FGW areas.

In the 1980s, feasibility and detailed design studies for Kalabagh Dam, the storage project that was envisaged to follow the construction of Tarbela Dam, were also started.

Assessment of Bank assistance in the Post-RAP Period

While Bank assistance during this period closely followed the RAP recommendations focusing on sustainability of irrigated agriculture and improving water delivery efficiency in SGW areas, the achievements were mixed, as explained below.

The OFWM investments were the most successful in terms of intended outcomes, including substantial “water savings”, increases in cropping intensities and farm incomes (see excerpts from OED précis below). However, from an institutional development view point the achievements were modest. WUAs were generally non-sustainable mainly because they did not have a continuing responsibility for O&M of the system above the *Mogha*. The 3rd On Farm Water Management (OFWM) project Implementation Completion Report (ICR) observed that “ For long term sustainability of the irrigation system, participation of farmers in irrigation management is necessary. Their participation could be enhanced if the farmers’ organizations have a continuous crucial role in O&M of the system. They should be responsible for distribution of water and collection of revenue resulting from water charges. In Pakistan’s irrigation system, this could be achieved by forming FOs at the secondary canal level i.e. distributaries/minors.”

The drainage investments in SGW areas while solving local water logging problems, faced sustainability and environmental issues:

- Firstly, besides *off-farm drainage* these investments also supported investments for *on-farm drainage* –primarily a private good-- without requiring beneficiary contribution to capital cost. This gave the wrong signals to farmers that such investments would continue to be supported by the public sector. Furthermore, it down played the importance of improved water management to reduce the drainable surplus caused largely by over-irrigation.
- Secondly, except for limited investments in tile drainage, most subsurface drainage was based on large capacity tube wells. This choice of technology while reducing the initial capital cost, resulted in several problems: (i) farmers could not maintain the large capacity tubewells; (ii) deeper groundwater being invariably more saline than shallower groundwater, environmentally safe disposal of drainage effluent became a problem; (iii) local drainage disposal solutions received inadequate attention¹⁸²; (iv) the focus on vertical drainage, discouraged the development of local private industry for tile drainage (PVC resin and pipes, and contractors specializing in laying horizontal pipe drainage) that has been successfully developed on a large scale in other countries, e.g. Egypt.
- Thirdly, the projects involving surface drainage (e.g. LBOD Stage-1 Project) were not designed to handle storm water flooding nor was a system of flood management (flood warning or alarm system) made a part of the design. This deficiency has emerged as a major issue, particularly in the southern coastal district of Sindh (e.g. Badin) where recurring severe flooding has occurred on several occasions.
- Fourthly, most provinces defaulted on covenants requiring increases in water charges. The resulting low recoveries were highly inadequate for O&M, and drainage infrastructure remained the most poorly maintained part of the irrigation and drainage system.

Privatization of SCARPs in Punjab by replacing government owned and operated large tube wells with community owned and operated small capacity shallow tube wells was perhaps the most successful and path breaking investment supported by the Bank. Firstly, it greatly reduced the O&M burden of the government thus substantially reducing the O&M cost and recovery gap. Secondly, it broke the myth that water logging and soil salinity cannot be controlled by private and community tubewells without

compromising small farmers access to groundwater. Thirdly, it demonstrated that farmers can better meet their irrigation needs if they control the operation of tubewells.

The investments in system rehabilitation no doubt had short term benefits of reducing incidence of canal breaches and solving siltation and erosion in “problem” channels. However, due to the lack of essential institutional changes and adequate O&M, the situation reverted to the pre-rehabilitation situation within 3 to 5 years. The rehabilitation investments primarily aimed at restoring the system to its original design without any element of modernization to convert the system from a largely supply driven run-of-the river system to a more demand driven system¹⁸³ intended for more modern agriculture. Additional control and flow measurement structures and an O&M regime commensurate with its requirements were not supported as part of these investments. The latter would have essentially required a more fundamental institutional change with greater farmer participation and incentives as its center piece.

OED Observations: In 1992, OED carried out an ex-post evaluation of two OFWM and two ISRP projects. Excerpts from these evaluations are given below:

- As approved, the four projects supported some of the most important priorities established in the RAP. But as implemented, they strayed from the program's agreed strategy:
 - They failed to give highest priority to improvements in saline groundwater areas. In these areas—which have no supplementary well water—the returns to controlling water tables and supplying more surface water are the highest.
 - They came to be dominated by quantitative targets for watercourse improvement, regardless of the likely effects on water supply, water logging, and salinity.
- The water "saving"¹⁸⁴ impact of the 9,860 watercourses improved under three of the four projects, plus that from canal lining under CWMP, totals about 2.0 million acre feet (MAF), or 2.3 billion cubic meters... Although this is only a little more than half the savings anticipated under RAP, it is nevertheless, more than a new surface storage dam at Kalabagh would provide (though that would have power benefits as well). This next proposed main storage site would provide an estimated 3.5 million acre feet at the *mogha* at a cost of US\$3.5 billion (in a 1985 estimate).
- Canal rehabilitation and lining work in practice included significant capacity expansion contrary to the agreed program. This apparently occurred to allow the provinces to absorb additional water becoming available from Tarbela dam and to establish rights to that water before a formal allocation agreement took effect in 1991. In areas that could not safely absorb more water, the resulting increases in water logging and salinity have caused serious human and environmental problems.
- Program designers had envisaged a farm credit approach, arguing that farmers would find improvements in their watercourses profitable enough to repay loans. But, because of performance problems in the credit system, the improvements relied heavily on construction subsidies.
- Vested interests and the perquisites of project activities distorted the incentives to participants, just as the efficient management of the system as a whole was undermined by political influence and rent seeking.
- The bundling of assistance for the four provinces together in these four projects may have been administratively convenient, and clearly facilitates the Bank's wholesaling of development assistance, but is likely to have reduced the overall impact of the assistance.

- Recent projects have had some worthwhile and widespread poverty alleviation impact, but have also provided at the same time, without any justification, large transfers of public funds to many of the rural elite. Differentiation would permit, among other things, a more efficient allocation of scarce resources, taking relative needs into account.

The Post-Inter-Provincial Water Accord Period (1991—2005)

The beginning of the 1990s was marked by the conclusion of a long overdue Water Accord for sharing the Indus waters amongst the four provinces in 1991. A Water Sector Investment Planning Study (WSIPS) was also completed in 1990 to update the RAP recommendations and prioritize investments. The WSIPS emphasized the need for establishing a comprehensive and reliable Data Bank Network for water resources, agriculture, soils, etc. to guide investment planning; revitalizing institutional capacity in the provinces for investment planning; establishing a sector MIS; improving project approval and review processes; modernizing procurement processes; strengthening the local construction and consulting industries; and a training program for institutionalizing integrated comprehensive management of water resources.

However, by 1992 it had become clear that the RAP approach was not resolving the overriding problems of the irrigation system which remained in dire straits with problems similar to many other irrigation systems, including waterlogging and salinity, over-exploitation of fresh groundwater, low efficiency in delivery and use, inequitable distribution, unreliable delivery, and insufficient cost recovery system. It was realized that the RAP approach was not addressing the real underlying causes of the problems Pakistan's irrigation system was facing but rather trying to deal with the symptoms. With this realization, the Bank stopped new lending in the sector¹⁸⁵ till a far reaching new strategy to address the real causes was agreed with the Government. In 1994, the Bank completed a major sector study that resulted in the report entitled *Pakistan-Irrigation and Drainage: Issues and Options*. The key findings and recommendations of this report were:

- In Pakistan, as in many other countries, government treats irrigation water as a public good, whereas it is a private tradable good, for which markets can operate. Lack of well defined individual property rights and the illegality of sales of surface water severely constrain informal irrigation water markets. Instead of rooting out the barriers to water markets, Government publicly administers irrigation water. Inefficient pricing of water, resource misallocation, rent seeking behavior, and "illegal" trading is the result.
- The Government had not even adequately met the requirements of an administered system. It had failed to make budgetary provisions for operations. Moreover, the public body responsible for irrigation maintenance was separate from (and had poor coordination with) the agency responsible for revenue collection. In the past, administrative discipline was adequate but it had gradually broken down and the cost of irrigation maintenance had vastly increased. Nor were there any measures available to restore discipline.
- Economic efficiency in irrigation delivery and use cannot be achieved, because of lack of the right incentives.
- Unlike on-farm drainage, off-farm drainage is a public good. Thus, off-farm drainage will have to be supplied by the Government. However, the underlying problem of inappropriate institutional framework will require reforms that will ensure autonomy, transparency, and accountability of present institutional set-up for drainage.
- Any water service that is not a public good should be commercialized and later privatized.
- Only with market-determined incentives for irrigation and on-farm drainage is a sustained improvement in performance possible. The government needs to remove barriers to a free market in water. Most important, the government will have to draw up enforceable

property rights to water, without which any attempt to legalize and commercialize water markets would be futile. Property rights and legalized markets will make the opportunity cost of water transparent, leading to greater efficiency in use.

- The long-term option for the government will be to define individual water property rights, which are necessary to ensure equity in distribution. This would address the problems of tail-enders (that is, those at the tail end of the system who receive little or no water), while relieving pressure on ground water resources.
- As a first step toward individual water rights, Pakistan may like to aim for communal rights, which are legally and administratively easier to establish. User organizations can then translate these communal rights into enforceable individual rights of their members.

The National Drainage Program (NDP) Experience

While endorsing, in principle, the main elements of the above strategy, in 1995/96 GoP proposed its own model for implementing the reforms that envisaged replacing the provincial irrigation departments (PIDs) with a three-tier institutional setup comprising autonomous Irrigation and Drainage Authorities at the provincial levels, Area Water Boards (AWB) at the main canal level and Farmer Organizations (FOs) at the distributary canal levels. PIDs were to be established in all provinces while one pilot AWBs was to be established in each province with FOs at the distributary canal level. Supporting legislations in the form of PIDA Ordinances were passed and later endorsed by the Provincial governments as PIDA Acts. The emphasis was on organizations, not incentives and instruments, however. Water rights and entitlements that were advocated in the Bank's strategy paper were not on the immediate agenda. The Bank accepted the proposed model as a starting point for implementing the reforms as the center piece of the, misleadingly-named, NDP project assuming that a detailed strategy for implementing the reform model and dealing with difficult political and economic issues would be developed during the course of project implementation.

While a detailed evaluation of the NDP implementation experience is beyond the scope of this paper, suffice it to say that relative to its stated objectives and program targets, the implementation performance of NDP remained more or less unsatisfactory throughout and its outcomes have been modest. The main reasons for this unsatisfactory performance included, *inter alia*:

- Overly complex and ambitious project design that failed to address the realities of political economy embedded in the profound changes the reforms sought¹⁸⁶;
- Lack of ownership, particularly by the PIDs who saw the reforms as a threat to their existence and monopoly on water distribution, and offered immense resistance and inertia to the changes the reforms sought to bring¹⁸⁷;
- Lack of champions both at the working level and at the political levels (except in Sindh, and very recently in Punjab following changes in leadership);
- Focus on organizations not on instruments and incentives;
- Lack of attention to sequencing, prioritization and the “rules for reformers”.
- Lack of a detailed strategy for implementing the key elements of the reforms; the PIDA Acts envisaged a “stroke of the pen” conversion of PIDs into PIDs but lacked important details¹⁸⁸ for implementing the reform strategy. Furthermore, the Acts did not address the fundamental issues of legalizing water markets, or clarifying communal and individual water rights.
- The Bank's underlying assumption that transition plans, severance packages and change management arrangements would be defined and developed during implementation did not materialize due to constant distraction by other implementation issues and battles of turf and jurisdiction among the various participating agencies. Similarly, the expectations that more transparent volumetric measurements, bulk water sales and water charges based on volume would be introduced during implementation also did

not materialize as they received far lower priority than the easier to implement rehabilitation works.

- From 1999 onwards, the prevailing drought and resulting water shortages dominated the water sector debate in Pakistan and the issues surrounding new storage proposals distracted Government's attention away from drainage and institutional reform issues.

In retrospect, a drainage project covering all the provinces and envisaging a major civil works component was not the right vehicle for implementing reforms that sought to focus on improving irrigation service delivery through participatory management, a system of property rights and incentives. A more focused irrigation project would probably have been a more appropriate vehicle.

Notwithstanding this overall unsatisfactory rating, the NDP did yield several positive outcomes. First, it helped to clear the backlog of deferred maintenance of the existing system (some parts of the irrigation and drainage system had virtually no maintenance for several years). Second, although the institutional reforms component had a mixed performance, the need for the reforms has been endorsed at the highest levels of the GoP and Provinces, and Sindh made commendable progress. Third, it was instrumental in the completion of key policy and sector studies that have paved the way for introduction of a National Water Policy and a drainage sector strategy for the country. Fourth, the project improved the knowledge base by providing funding for institutions and individual researchers and contributing international experience through study tours and use of international panels of experts. Fifth, the project promoted farmer participation in the operation and maintenance of the irrigation system. Finally, the project provided a forum for the discussion of long term options for the sustainable development of the Indus River Basin, and as a consequence, has raised awareness of the importance of sound environmental planning and management.

Other Bank Assistance during the 1990s

Besides supporting the NDP project, Bank assistance included the projects listed below. Besides supporting a third OFWM project, of particular significance was the support for the Second SCARP Transition and the Punjab Private Sector Groundwater Development Projects¹⁸⁹ that completed the privatization of the remaining 6,000 SCARP tube wells in FGW areas of Punjab, providing substantial relief to its O&M burden. Other projects were: the Fordwah Eastern Sadiqia Irrigation and Drainage Project that successfully established the first pilot FOs in Punjab, who were handed over irrigation O&M and revenue collection responsibility in the Bahawalnagar area of Punjab; a Flood Damage Restoration Project; and a Community Irrigation Project in Balochistan. Although the preparation of feasibility and detailed design (including bid documents) for the Kalabagh Dam were substantially completed, implementation was not started because of environmental and political controversies.

Table-5: Bank Assistance During 1991-2000

<i>Sr. #</i>	<i>Financier</i>	<i>Description</i>	<i>Amount US \$ (Current)</i>	<i>Amount US \$ (2004/05)</i>	<i>Approval Date</i>
1	IBRD	On-Farm Water Management III	36,300,000	137,940,000	21-May-91
2	IDA	On-Farm Water Management III	47,300,000	179,740,000	21-May-91
3	IDA	SCARP Transition II	20,000,000	76,000,000	4-Jun-91
4	IDA	Fordwah Eastern Sadiqia Irrigation & Drainage	54,200,000	162,600,000	2-Jul-92
5	IDA	1992 Flood Damage Restoration	100,000,000	300,000,000	4-Mar-93
6	IDA	Balochistan Community Irrigation	26,700,000	61,410,000	26-Sep-95

7	IDA	Punjab Private Sector Groundwater Development	56,000,000	112,000,000	11-Jul-96
8	IDA	National Drainage Program	285,000,000	541,500,000	4-Nov-97
Total			625,500,000	1,571,190,000	

Bank Assistance After 2000 and Post-NDP

Following the mixed experience and outcomes of NDP, the Bank adopted an interim strategy till a new CWRAS is agreed with the government. This interim strategy has identified areas for partnership and mutually agreed with GoP and Provinces on the need to complement the reform agenda with investments in infrastructure. It distinguishes two possible scenarios: the first one formed by interventions that could stand on their own merits and that could reap significant benefits for productivity enhancement, income generation, capacity building at the farm level, and to guarantee the safety of existing infrastructure (barrages); the second one (“high case” scenario) would seek progress in the articulation of the reform instruments (enforceable water entitlements and water rights, participation of stakeholders, transfer of responsibility over asset management, accountable institutions, water pricing and cost recovery policies, and environmental flows) so as to justify major interventions in storage, irrigation infrastructure, and long term solutions to inter-provincial drainage problems. With respect to irrigation, the overall strategy will be to un-bundle at the provincial level the support initially provided under NDP, and support the provinces that have demonstrated initial results and commitment.

In line with this interim strategy, the Bank approved On-Farm Water Management Projects for NWFP and Sindh that provide support for physical improvements at the on-farm¹⁹⁰, watercourse, distributary and branch canal levels as well as for the reforms initiated under the NDP project. In addition, the Bank reallocated funds from the NDP Credit for Drought Emergency Rehabilitation and more recently approved a project for the rehabilitation of the Taunsa Barrage on an emergency basis.

Recent Sector Work

In 2003, as part of the Public Expenditure Review (PER), the Bank carried out a systematic review of public spending in the water sector and highlighted a series of strategic issues to be addressed by the Government and the Pakistan society. The review culminated in the Public Expenditure Management Vol II, entitled *Pakistan: Accelerated Development of Water Resources and Irrigated Agriculture, September 2003*. The main findings and recommendations of this review were:

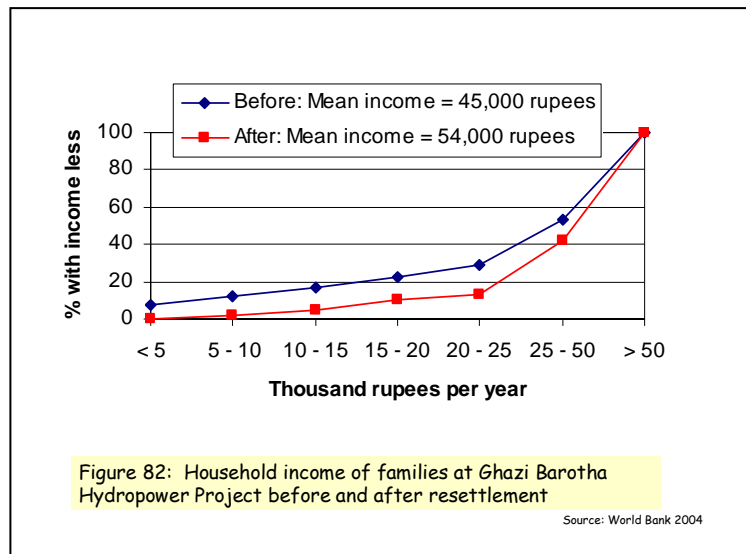
- Pakistan has been living off the great expansion in irrigated agriculture since the late 1970s when the last major storage reservoir was completed. With the exception of two major drains to serve irrigated areas on the left and right banks of the lower Indus River, investment has been limited since that time mainly to *ad hoc* rehabilitation of canals and drains and salinity control tubewells.
- There is little doubt that water sector investment must increase substantially to meet urgent needs for modernization of the distribution system, groundwater management, controlling soil and water salinity, as well as improving governance and the accountability of the institutions responsible for irrigation water service. However, investment in infrastructure alone will not meet the challenges – key policy changes and institutional and governance reforms are at least as important.
- The major strategic issues facing Pakistan in the Indus Basin, include soil and water salinity; environmental degradation of the lower river and estuary; inter-provincial conflict over water allocation and management; vulnerability to drought and supply reliability; and pervasive inequity, inefficiency and low productivity.

- A “supply side” approach has long been the staple water policy in Pakistan, and as one might expect, new water supply (dams) and new canals dominate the current proposals for investment in the sector. But looking to the future, the combination of high population growth, persistent poverty, lagging growth in rural areas, and the looming constraints on *water resources suggests that water resources development and management in the next 40 years will be and must be by design substantially different than the past 40 years*. A genuine paradigm shift is needed in the water sector in which water is “managed” from the mountain tops to the root zone of the Indus Basin.
- The strategy going forward must:
 - Modernize both the water infrastructure and the institutional and governance arrangements for water management, and improve strategic planning and the knowledge base that supports planning, policy analysis and investment (R&D, information systems)
 - Balance short-term and long-term benefits, by making investments in both water infrastructure and water management, and in both supply and demand management
 - Better integrate irrigation, hydropower and agricultural development investment programs and policy;
 - Reflect a more rigorous economic, social and environmental analysis to ensure that project priorities and plans make the best use of the limited resource and fiscal space;
 - Be supported by a new consensus on water management and development that avoids the costly political conflicts of the past;
 - Choose judiciously among investments in supply expansion, system expansion, management, environmental sustainability, productivity and governance, and then sequencing these over time to achieve a timely and sustainable development program with real and substantial economic and social benefits.

Hydropower

As shown in Figure 82, the Bank has had an episodic engagement with hydropower in Pakistan. Hydropower was a major element of the Bank-funded Tarbela Dam (discussed in the earlier section), with 60% of all benefits from Tarbela being due to hydropower, and with the value of hydropower benefits ex post substantially higher than expected at appraisal.

More recently, the Bank made a loan of \$350 in 1996 for the successful \$2,000 million Ghazi Barotha hydropower project¹⁹¹. The project was completed on time and on budget. It produces electricity of high value (since peaking power is particularly short) at a very low cost of 1.7 US cents per kwh (compared to an average generation cost in Pakistan of 6.0 cents per kwh). The rate of return of the project was very high at appraisal and



even higher ex post -- the economic rate of return was 22.5% (versus 20% at appraisal) and the financial rate of return of 15.1% (versus 13.8% at appraisal).¹⁹² In addition to its large direct contribution to the Pakistani economy, Ghazi meant that the Bank was involved in a power sector reform program in which WAPDA was to be unbundled into independent generation, transmission and distribution companies (a process not yet complete). Finally, Ghazi dealt very successfully with complex resettlement issues, which included legacies from Tarbela. Figure 82 shows that those who were resettled were much better off after than before the project, with average household income increased by about 20%.

Water Supply and Sanitation¹⁹³

Water supply and sanitation (WSS) has been an integral part of the social sector investment portfolio of the World Bank. Starting modestly in 1960s, the Bank's overall WSS portfolio grew to 9% of total commitments in 1979. Subsequently, dedicated lending decreased to about 3% excluding WSS components of non-dedicated lending categories. Currently the bank, world-wide, has 100 dedicated WSS projects and another 150 non-dedicated projects with significant WSS components. Lately, interest in the sector has grown because three targets under MDGs depend on improving the coverage and quality of WSS service delivery.

World Bank's involvement, as well as its experience, in the WSS in Pakistan, has been modest even compared with its overall world-wide engagement in the sector. Starting in late 1960s, the Bank has financed just five dedicated WSS projects until 1999, five years ago focusing primarily on water supply rather than sanitation. The Bank has not financed any major sanitation project although there are new projects like the Punjab Municipal Service Improvement Project being appraised with possible Bank involvement in future.

Of the five Bank supported projects, just one project covered rural WSS. Four projects were in the two largest cities of Karachi and Lahore. The results have been mixed at best, because, according to OED reports:

- Legal frameworks and regulatory mechanisms were absent and hindered achievement of ambitious project objectives.
- The functions of service provision and regulation were not separated.
- Strategies were needed to minimize political interference in operational and policy matters (especially employment).
- Capital cost contributions and cost recovery needed to be improved while protecting the interest of "the poorest of the poor". There were opportunities for market segmentation and differential pricing that could be exploited.
- The sanitation aspect in most of the projects was not addressed.

The following is a summary of the Bank supported WSS projects based on various Bank documents.

Lahore Water Supply Sewerage and Drainage Project (1967-72)

The main objectives of this relatively small Urban Water Supply Project were to rehabilitate and expand water supply, sewerage and drainage facilities at Lahore and to help establish an institutional capability to efficiently operate existing facilities and to develop capacity for long range program expansion. According to an OED report, revision of the scope and design made evaluation and comparison with original appraisal difficult. Despite difficulties the long-run development objectives of water, sewerage and drainage were achieved.

Second Lahore Water Supply Sewerage and Drainage Project (1976)

Project objectives were to (a) continue with the improvement and extension of Lahore's water supply, sewerage and drainage system; (b) develop an efficient public utility organization which would be competent to continue the implementation of a proposed ten year investment plan; and (c) develop an urban project which IA subsequently helped to finance. According to OED, the project was successful: the main project objectives were met and the physical components implemented. Tariff adjustments helped WASA to make good progress toward meeting revised financial covenants. Project illustrated the need to allow for sufficient time in project implementation schedules for institution building and human resource development. Great emphasis on dealing with physical implementation problems was at the expense of operational aspects. OED noted that Lahore is fortunate to have a 24 hour water supply and a comprehensive sewerage system. The service needs continue to grow as the city expands while requests for increase in tariff level are met reluctantly. The situation of Lahore, located on a sweet water aquifer and in close proximity to river Ravi with potential recharge, is unique and duplicating this model may be a challenge else where in the country.

Karachi Water Supply and Sanitation Projects (1983-1991)

Objectives were to (a) increase Karachi's water supply by 60 MGD (b) introduce system and household metering; and (c) strengthen the Karachi Water and Sewerage Board (KWSB) through TA and Training. The project helped increase supply between 60-70 MGD. However, success in controlling leakages was limited. Through installation of meters and repairs there was an improvement in revenue recoveries from bulk users but it had less effect on revenue from domestic consumers. Project increased long term quality and reliability of bulk supply to Karachi. However, KWSB still did not achieve financial sustainability and required subsidy. The project helped strengthen KWSB capacities to manage and execute large projects. The June 2000 OED observations on the project stressed the need for an adequate regulatory framework that provided sufficient management autonomy and a path for reform that guarantees sustainability, limitations of financial covenants and conditionality, and the need to incorporate in project design valuable local experiences, particularly when they specifically address poverty alleviation. Overall, OED evaluated the project outcomes to be unsatisfactory with unlikely sustainability.

Second Karachi Water and Sanitation Project

The main objectives of this follow up project were to (1) increase potable water supply and reduce water losses (2) improve the financial viability of the Karachi water and Sewerage Board (KWSB) through increased revenues, cost reduction and increased operational efficiency; (3) improve the organization and management of KWSB; (4) improve sanitation in the City of Karachi, including its low-income and coastal area by increasing sewerage coverage and sewage treatment capacity.

An OED evaluation states that none of the four objectives were fully achieved (1) the water supply was increased but no reduction in losses is documented (2) The financial viability of the KWSB hardly improved; it survived due to government subsidies throughout the 1990's. The operational efficiency and the intended reduction in water losses of KWSB were impossible to gauge since it chose not to meter domestic consumption. KWSB's organization and management did not improve even after reducing staff from 14,000 to 8,500 and some limited administrative improvements. The water supply quantity and quality are probably worse after completion of the project because of a rapid population growth in Karachi and especially among the low-income population. A significant shortcoming was the legal and regulatory framework. An effort was belatedly made at the behest of the Bank to involve a private operator but in the end these efforts came to nothing.

According to OED, the main lessons learned were that without a fundamental legislative and regulatory reform, including changed incentives and contracting of a private operator, the project was doomed from the start; financial covenants were ineffective if KWSB lacked the authority and means to comply with them; excessive politicization of the tariff setting and of the management added to the difficulties; and the project design should have incorporated more of community participation

especially under the sanitation component where Karachi had gained valuable experience from the well-known Orangi Pilot Project.

Rural Water Supply and Sanitation (1992-95)

This project covered all four provinces as well as AJK. As per OED, “it is difficult to measure the achievement of general project objective of improving rural productivity and health particularly of women and children and reduce poverty and deprivation in rural Azad Jammu and Kashmir (AJK), Balochistan and Sindh, since the project failed to develop monitoring and impact indicators. There was success in implementing the hardware components, while the software components were scaled back considerably. In the three provinces, only between half and two thirds of the institutional development assistance funds were actually spent.

The project was first IDA financed rural water supply project in Pakistan with a demand-driven approach incorporating significant community involvement—and with contributions from beneficiaries toward the capital investments. The new methodology required a change of mind-set of public schemes that had proved unsustainable. Indications are that roughly 95% of the water schemes built under the project are still operating three years after completion. In terms of shortcomings --- the program to expand sanitary excreta disposal programs did not meet the expected acceptance and fell far short of planned achievements.

OED in its review of the project noted the following lessons learned from this experience:

- A demand-driven rural water supply and sanitation strategy based on strong community participation requires a longer time to take root than what is usually offered by one single project. The AJK component performed better than the Balochistan and Sindh components precisely because it enjoyed a century’s old tradition of community participation whereas the other two did not.
- Changing the habits of excreta disposal implies a much greater effort than providing water supply. Symptomatically, the water supply investments performed much better than the latrine components.
- Project objectives should be stated in terms that would allow quantitative monitoring of progress towards reaching them.

The Bank’s new Water Strategy

In parallel with these reviews of World Bank engagement in water in Pakistan, and influenced by them, the World Bank developed a new Water Strategy, which was approved by the Board of the Bank in 2003, and set a new direction for Bank engagement in water throughout the world. The main messages of the 2003 Water Strategy are:

- Water resources management and development is central to sustainable growth and poverty reduction and therefore of central importance to the mission of the World Bank.
- Most developing countries need to be active both in management and development of water resources infrastructure.
- The main management challenge is not a vision of integrated water resources management but a “pragmatic but principled” approach that respects principles of efficiency, equity and sustainability, but recognizes that water resources management is intensely political, and that reform requires the articulation of prioritized, sequenced, practical and patient interventions.
- The World Bank needs to assist countries in developing and maintaining appropriate stocks of well-performing hydraulic infrastructure and in mobilizing public and private financing, while meeting environmental and social standards.

- The World Bank will re-engage with high-reward/high-risk hydraulic infrastructure, using a more effective business model.
- The Bank’s water assistance must be tailored to country circumstances and be consistent with the overarching Country Assistance Strategies.

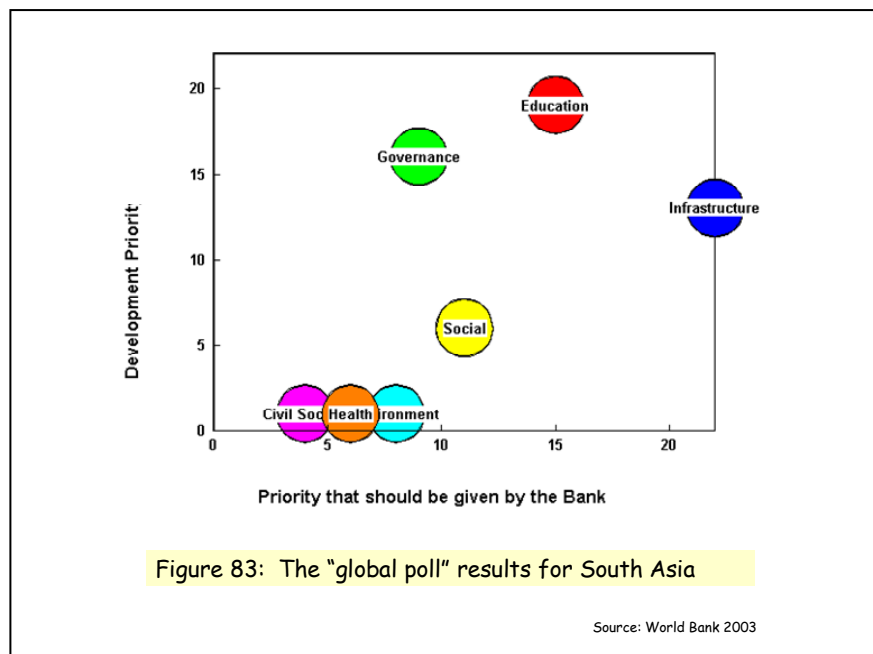
Subsequently the Board drew on the main messages – of more aggressive Bank engagement in infrastructure – in setting the parameters for an Infrastructure Action Plan. And recently, the major OED annual review, the Annual Review of Project Effectiveness, carries the same message, saying that “The World Bank should focus on promoting economic growth rather than social policies as the route to reducing poverty... and calling on the Bank to refocus its efforts on infrastructure projects and urban and rural development”¹⁹⁴.

An indicative World Bank water investment program for 2006-2010:

The four pillars:

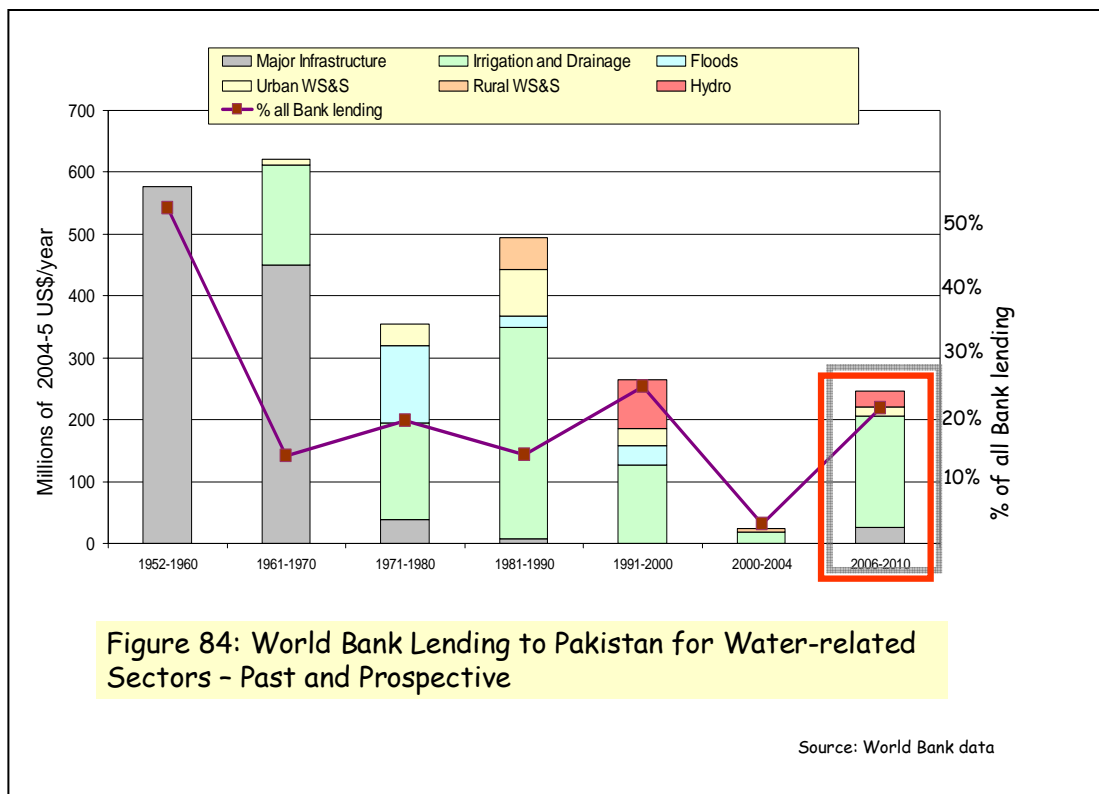
An important objective of this Report is to be an input into defining the water elements of the framework (known as the Country Assistance Strategy) which will govern the relationships between the World Bank and Pakistan for the period 2006-2010. The program described here is “almost but not quite” final. “Almost”: because there have been extensive discussions between the Bank and the Federal and Provincial governments of Pakistan over water-related priorities over the past eighteen months. The indicative program described here is a product of those discussions and thus one on which there is close agreement between the government and the Bank. Second, “not quite”: the details of the “Government of Pakistan-World Bank contract on water” for the next four years will only be finalized, necessarily and appropriately, over the next several months as Bank management and the Ministry of Finance finalize the overall CAS.

Since 1980, investments in the irrigated agriculture sector (water and agriculture) have been declining, both as a percentage of the total public spending and as a percentage of GDP. In 2003, the total allocation for agriculture and water represented only about 0.5% of GDP. The Federal and Provincial governments and the management of the World Bank all agree that water management is one of the central development challenges facing Pakistan and that investments in the sector must be increased substantially. The Federal Government is already demonstrating its commitment in this regard. The allocation for water in the Public Sector Development Program (Federal Development Budget) jumped from Rs



20 billion in FY05 to over Rs 35 billion in FY06 representing a 75 percent increase. This is in broad agreement with the findings of a major poll of a wide variety of South Asian stakeholders (Figure 83), which concluded that infrastructure, education and governance were the three areas which were both of high national importance and where the Bank was perceived to have a comparative advantage.

There is also a general agreement that water sector is an area where the Bank has a long history and a strong comparative advantage. There is, therefore, a general agreement that there will be a major increase in Bank lending for water-related activities, with the indicative overall figures shown in Figure 84. This would mean that water-related lending for Pakistan would increase about 10 fold from the 2000-2004 period, and account for over \$1 billion in the coming four years.



Given the diverse set of challenges facing the sector and the large need for resources, Bank support would need to be selective, keeping in view the Bank’s comparative advantage, other donors’ traditional areas of support, and the priorities identified in this Report. World Bank support would focus on instruments and incentives for reforms rather than simply on organizations, programs and projects. It would be based on “principled pragmatism” recognizing that reforms and investments must proceed in parallel and the best should not be allowed to become the enemy of the good. Broadly speaking, Bank assistance would support four pillars of the water sector, as described below:

Pillar 1: Asset Development and Management:

Pakistan has a large endowment (with an estimated replacement value of US\$60 to 70 billion) of water resources infrastructure, most owned and managed by the provinces, and much now quite old. As described in this Report, the condition of this stock of infrastructure is a major cause of concern. In some instances – such as Taunsa and Sukkur barrages – the precarious state of major structures puts the well-being of tens of millions of people at risk. In other instances, the effect is more insidious,

with the poor condition of canals and pipes and treatment plants meaning that infrastructure does not produce the services it should, and people have to adapt to unreliable and sub-standard services.

For these reasons a major focus of Bank engagement over the next four years will be to simultaneously finance much needed investments in rehabilitation of some critical assets (including barrages) and to work with Federal and Provincial authorities to develop a more appropriate culture and practice of asset rehabilitation and management. This will include an emphasis on development of Asset Management Plans, which will include an inventory of existing assets, an evaluation of their condition and the requirements for one-time and regular rehabilitation, and for maintenance. Out of this assessment will emerge a set of short- and medium-term priorities for asset rehabilitation and maintenance. The Asset Management Plans will make explicit the requirements (and trade-offs) for public and user financing, and the importance for developing efficient institutional arrangements for rehabilitating and maintaining this infrastructure.

As is evident throughout this Report, most of the water in Pakistan is already allocated. The implicit view of the Bank, accordingly, is that attention should be focused on sustaining the infrastructure that has been built, and improving the productivity of water. A vital part of Bank activity in the past has been on drainage. The Bank will continue to invest, as part of provincial investment programs, in drainage and salt management investments, and will continue to contribute to the evolution of national and provincial drainage and salt management strategies.

One major issue that is likely to emerge in the next CAS period is possible Bank engagement in developing and co-financing major new Indus Basin storage and hydropower, if and when the Government makes such a decision. As is discussed in detail in this Report, this is a highly-controversial issue in Pakistan, in part because of reasonable concerns about the cost and impact of a new dam and the distribution of costs and benefits, in part because of dissatisfactions with the lack of transparency with implementation of the Water Accord, and in part because this acts as a surrogate for a series of weakly-related historic and contemporary political grievances. Over the past decade, the Bank has tended to shy away from engagement with such controversial issues because of reputational risks to the Bank (with Bank investments in hydropower, for example, falling by about 90% over the course of the last decade). More recently, the Board of the Bank has debated these questions at length (including in course of discussions on both the Water Strategy and the Infrastructure Action Plan). The Bank's borrowers have all said that the Bank is needed precisely where issues are complex and difficult. The broad conclusion is that the Bank must re-engage with such "high-risk/high-reward" investments when there is a sound case for doing this and when the Bank has a strong comparative advantage. In the case of possible storage on the Indus, then, the Bank understands fully and exactly how controversial this issue is. But the Bank also believes that new storage is of overwhelming national importance to Pakistan, and that delay makes things more difficult not easier. Accordingly, in discussions with the Government it has been agreed that Bank could be involved in financing a new dam on the Indus if the economic, technical, social and environmental, institutional, financial and commercial feasibility is established. As Government understands, and as this Report has repeatedly stressed, building a dam is just one part of a set of necessary activities, which include improving the transparency and efficiency of administration of the Water Accord, and making a set of institutional reforms and investments at provincial, canal command and farm levels to ensure better use of water.

This Report has concentrated heavily on the challenges in the Indus Basin, because they loom so large in Pakistan and because they are so complex. This focus notwithstanding, the Bank's investment program includes investments in infrastructure (mostly in NWFP and Balochistan) in small dams and minor irrigation schemes and in groundwater management in the *barani* areas outside the Indus Basin.

In the urban water and sanitation sector, the Bank is likely to finance a project in Punjab, which would implement the recommendations of the ongoing studies, as well as rehabilitation and extension of the

delivery systems. If it is not possible to design a long-term concession contract for Lahore, then this loan might also fund investments which would be included in a lease contract.

Pillar 2: Water Resources Management

As stressed throughout this Report, the development and management of the water resources of Pakistan in general and the Indus Basin is a huge challenge, requiring very high levels of administrative, engineering and scientific capability. There is broad agreement that over recent decades the capacity for modern water resources management at both the Federal and Provincial levels has not evolved rapidly enough to meet the emerging challenges.

Accordingly, over the next CAS period the Bank will give high priority to supporting the development of capacity at the provincial and federal levels. For surface water supplies a major emphasis will be building on Pakistan's platform of defined water entitlements, making the administration of these more transparent and accountable, from the inter-provincial to the user levels. For groundwater, the Bank will support the development of a government capacity for knowledge generation and management, and for policy and implementation of groundwater management. In both cases, there will be an emphasis on incorporating environmental issues (including water quality, wetlands and environmental flows). An important element of Bank support will be training of a new generation of multi-disciplinary water resources specialists; and will include stimulation of centers of excellence for water resources sciences.

Pillar 3: Service Delivery

Infrastructure is, of course, not an end in itself, but a means to the end of providing users with better, more sustainable services. In many ways, State water institutions in Pakistan (at both the Federal and Provincial levels) have not made the transition from the era of development and construction to the era where management of resources and services is the primary challenge. The formal service delivery structures for both irrigation and water and sanitation services are exclusively large public enterprises, which operate with little accountability to their users, and with little transparency. Helping start the transition away from this old model to a modern service delivery architecture was the major objective of the (mis-named) National Drainage Program (which emphasized issues of water user associations and autonomous provincial irrigation agencies). While achievements under the NDP were (as described earlier) modest, many lessons were learned (about keeping projects focused on a few key objectives, and about the need for encouraging experimentation with different forms of sound institutional reform), the centrality of the objectives of the NDP remain valid.

Accordingly, the Bank will remain heavily engaged in provincial efforts to improve the quality, efficiency and accountability with which services are delivered. Specifically, for reasons described in this Report, the Bank will emphasize instruments as much as organizational forms. This will mean an emphasis on the development of frameworks which encourage the entry of new players (including community organizations, and the small- and large-scale private sector), the use of contracts which specify the rights and obligations of providers and users and benchmarking for all water services. The Bank will put a major emphasis on the nexus of entitlements, measurements and transparency. This will mean emphasizing measurement and reporting throughout, and the associated investments in measurement devices, information technology and real-time reporting of what is actually delivered to whom.

Pillar 4: On-farm Productivity

An important distinction between water supply services and irrigation services is that the former are an end in themselves, whereas the latter are simply one input into a multi-faceted effort to improve agricultural production. Many of the elements of this challenge (such as credit, marketing and agricultural research and extension services) are addressed as part of the Bank's overall rural and agricultural program, and addressed in companion work on those sectors. The Bank's water portfolio, however, has and will continue to go beyond delivery of water services, and involve investments in on-farm services (land leveling, watercourse lining, introduction of new technologies) which are essential for agricultural diversification and for improving the amount of crop, income and jobs produced per drop of water.

Priorities and Sequencing

Pakistan needs to move forward on all the four pillars simultaneously. Priorities and sequencing of investments (short-, medium-, and long-term) should seek to maximize benefits (measured in terms of public welfare) from policy reforms and investments, subject to various constraints (budget, water and other resources).

In the short term (next 1 to 2 years), the focus would need to be on the low hanging fruit under each pillar, which can be harvested at relatively low cost and effort with high returns. These include improving asset management planning; establishing O&M cost sharing principles; investing in critical rehabilitation; high pay-off investments that would improve water use efficiencies; reducing costs; decentralizing irrigation management; ensuring greater transparency in water entitlements and allocations; putting systems and instruments in place; and starting activities that have longer gestation periods, such as planning for major infrastructure human resource development and capacity building.

In the medium term (next 3 to 5 years), the focus would need to be on items that require further preparatory work and analysis of trade-offs (investments in new reservoirs, system expansion, groundwater management, research and capacity building).

Finally, in the long term (6 to 10 years), Pakistan would need to focus on human resource development; reviving excellence in research and development; attaining financial sustainability for the sector and meeting the Millennium Goals for drinking water supply and sanitation.

The investment projects:

Over the course of the past year, the Government and the Bank have identified an indicative set of projects and programs which Pakistan is likely to ask the Bank to finance. It is agreed that the Bank would provide support through its various lending instruments, including budgetary support for policies and prior actions that address key issues (Development Policy Lending) as well as through specific investment lending for infrastructure and institutional reforms. There is agreement that there will be a major increase in Bank lending for water-related activities, with the indicative overall figures shown in Figure 84. This would mean that water-related lending for Pakistan would increase about 10-fold from the 2000-2004 period, and account for about \$1 billion in the coming four years. The tentative lending program for the next four years would be as follows:

Punjab Irrigation Policy Loan (US\$ 400 million): This 3 to 4 year program would support the reform program in Punjab's irrigation sector, built on four pillars: asset development and management; water resource management (including investments in capacity building, knowledge generation and management, and pilot projects for groundwater management); reform of irrigation service delivery; and enhanced on-farm services to increase water productivity. The policy framework could include a medium-term (ten year) vision of how Punjab wishes to change its management of water resources and

irrigation services, including broad outcomes and targets and short-term targets of what can be achieved immediately in terms of the policy and institutional reforms.

Punjab Municipal Services Improvement Loan (US\$ 65 million): This loan is designed to improve efficiency, coverage and quality of basic infrastructure/services through: developing an efficient mechanism for allocating public resources for infrastructure; building capacity of government to manage local government performance improvement and of city districts/TMAs for improved urban management, governance and delivery of urban services and; providing performance-related matching grants for infrastructure repair/renewal. It is likely that water and sewerage services would be part of this.

Sindh Water/Irrigation Sector Improvement Program (US\$ 140 Million): The project would improve water productivity through a reform agenda/investments leading to better management system that links canal command areas, the distributary and the watercourse level. Components include; capacity building; civil works; agriculture and irrigation technology; and management and administration.

NWFP – Irrigation Sector Improvement Program (US\$ 70 million): The project would improve water productivity through a reform agenda/investments leading to better management system that links canal command areas, the distributary and the watercourse level. Components include; capacity building; civil works; agriculture and irrigation technology; and management and administration.

Private Power (Bank Group) Investment (Total \$200 million): In view of the projected shortfall in generating capacity (from about 2007-08), there is an urgent need to elicit private sector resources for new/greenfield generation projects. The Bank, jointly with IFC and/or MIGA, would support Government efforts to attract private investments for such projects, including, potentially, both run-of-the-river and multipurpose hydropower projects.

Punjab Water Infrastructure Investment (US\$ 150 million): Several barrages in Punjab require rehabilitation and modernization to address problems arising from deficiencies which could lead to progressive structural failure and serious economic consequences. Besides physical rehabilitation, improvements and modernization, the project will also support institutional and organizational restructuring and capacity building, and improved O&M regimes.

Balochistan Small-Scale Irrigation (US\$ 40 million): The project would develop water resources through restoring and increasing water storage; increasing productivity of water through more efficient use, and developing capacity to formulate a water resources development plan using surface, groundwater and watershed management. Components include: water management (with a special emphasis on groundwater); infrastructure for restoring the hydrological balance of Band Khushdil Khan; construction of delay action dams and selected small-scale irrigation projects; on-farm water management; modernization of irrigation systems and subsidies for efficient on-farm irrigation systems and modern irrigation technologies; and institutional development - among farmers, water users and different levels of government.

Punjab Water Sector Irrigation Investment (US\$ 100 million): The project would support institutional reforms in water resource management and delivery of irrigation services in specific canal commands of Punjab through an "incentive-based approach". Farmers and farmer organizations will play a major role and would compete for a set of "rewards" for meeting specified "entry conditions". The "entry conditions" would relate to items like formation of farmer organization, commitment to implementing water entitlements, provider/user contracts, water measurement and monitoring. The "rewards" would be investments in capacity building, canal modernization, measurement devices, and

on-farm services and possibly an option in which the farmers could choose "professional management."

A Federal Water Resources Capacity Building Loan (US \$ 40 million): This project would develop the capacity of the Federal Government (including the proposed National Water Council and its Secretariat, IRSA, Planning Commissions Water Resources Section, and WAPDA-water wing) to become a more effective custodian of the nation's water resources. It will include major investments in knowledge management (including modernization of measuring equipment, decision support systems, and priority applied research); it will include training of a new generation of multi-disciplinary water resources specialists; and will include stimulation of centers of excellence for water resources sciences.

One major issue that is likely to emerge in the next CAS period – but is not included in the current indicative list of projects -- is possible Bank engagement in developing and co-financing major new Indus Basin storage and hydro, if and when the Government makes such a decision. In discussions with the Government it has been agreed that Bank could be involved if the economic, technical, social and environmental, institutional, financial and commercial feasibility is established and these investments are accompanied by institutional reforms and investments at provincial, canal command and farm levels to ensure better use of water.

Analytic and Advisory Services:

As described throughout this report, Pakistan is going to have to invest heavily in the generation and management of knowledge. Pakistan looks to the Bank as a major partner for providing global knowledge on modern water development and management. In the past the Bank has provided such services out of its own resources and by making use of a variety of global trust funds. Given the need to intensify such analytic and advisory services, the Bank is developing, with partial support from the Government of the Netherlands, a multi-year program which would enable the provision of a greatly-increased set of advisory, knowledge and capacity building services to both Federal and Provincial governments.

In the important urban water and sanitation sector, the Bank Group has recently become involved in an advisory capacity in Punjab. The IFC is providing advisory services for Lahore, while the Bank is helping to investigate contractual incentives, financing mechanisms, pricing, regulatory mechanisms and building capacity to improve urban water and sanitation services in other towns.

The Bank has not been involved in rural water supply and sanitation for some time, and thus has limited knowledge of the sector. Given the importance of this sector for welfare of many poor people, the Bank needs to re-engage. A first step would be a review of the status of the sector and key policies, with a particular focus on the project initiation and design mechanisms, the supply chain, cost recovery and operations and maintenance arrangements. A major challenge is likely to be the evolution of infrastructure-driven Public Health Engineering Departments.

Evolving priorities and the indicative Bank water investment program

The Country Assistance Strategy is not a document which is set in stone, but rather a living document (with an associated set of lending and non-lending activities) which evolves as conditions and knowledge change. The intensive work and discussions which were part of producing this document have, predictably and appropriately, changed perceptions both in Pakistan and the Bank and brought to the fore several hitherto relatively-neglected priorities. In particular there are two areas that are likely to gain greater prominence than they have in the current indicative CAS plan.

The first of these is urban water supply and sanitation. Pakistan is urbanizing and industrializing rapidly. While irrigation will remain by far the largest user of water, in the future water development and management in Pakistan will no longer be synonymous with irrigation and drainage. There are several dimensions to this shift: more and more water will need to be reallocated from agricultural to urban uses; much greater investments will need to be made in collecting and treating urban and industrial wastes; and major changes will need to be made in the way in which urban services are financed and delivered so that coverage and service quality are improved. To a substantial degree the long history of Bank engagement with water through the irrigation sector in Pakistan has meant that the Bank's view, and the Bank's water-related investments (as shown in Figure 84), have not adequately reflected the need for similarly-intense attention to municipal and industrial water and wastewater. The discussions stimulated by this Report concluded that this is indeed an area where Pakistan's needs are large and growing, and where the Bank needs to become more engaged. The Bank will do this by initiating detailed analytic work on municipal and industrial water and wastewater. It is likely that a product of this work will be a program of Bank investments in municipal and industrial water and wastewater which is more substantial than that reflected in this Report.

The second area of relative Bank neglect that emerged during discussions of this Report is that of hydropower. Again, in part stimulated by the discussions around this Report, the Bank will start a process of more specific assessment of the role of hydropower (micro and mini and large, both through run-of-the-river and storage projects) and the potential for greater Bank involvement.