

ENDNOTES

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- 80 Paper 12
- 81 Kemper and Briscoe Mexico paper
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- 84 Paper 12
- 85 Paper 12
- 86 Paper 12
- 87 This section draws heavily, and often directly, on the background paper by Bhutta and Smedema Paper 17
- 88 Paper 17
- 89 Paper 12
- 90 Paper 12
- 91 This section draws heavily, and often directly, on the background paper by Vakar Zachariah
- 92 Paper 3
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- ⁹⁶ Paper 3
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- ¹⁰⁵ Paper 15
- ¹⁰⁶ Paper 15
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- ¹⁰⁹ Estimates prepared by Punjab IPD September 2005.
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- ¹¹⁴ An asset value of US\$60 billion over 20 million hectares implies an asset per hectare served of US\$3,000.
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- ¹¹⁶ Pervaiz paper 11
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- ¹¹⁸ WCD study
- ¹¹⁹ Paper 4
- ¹²⁰ Supplementing data of Ledec 2003.
- ¹²¹ Khaled Ahmed: “Sindh: The feel-bad factor”, The Friday Times, Lahore, May 2005
- ¹²² Sardar Tariq paper 14
- ¹²³ Pervaiz Amir paper 11
- ¹²⁴ Paper 2
- ¹²⁵ WDR 1992
- ¹²⁶ Paper 3
- ¹²⁷ Paper 9
- ¹²⁸ For example, if rainfall is higher, streamflow may extend over several months in addition to the relatively short duration flood flows, in which case proportionately more water can be stored for a longer period if the site has sufficient reservoir capacity. However, since the prevailing conditions over most of the year are arid to semi-arid, there must always be a concern for the higher evapotranspiration losses that stem from storage of water in an open reservoir.
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- ¹⁴¹ Paper 9
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- ¹⁴³ Stephen E. White and David E. Kromm. “Local groundwater management effectiveness in the Colorado and Kansas Ogallala Region”, Natural Resources Journal, Vol 35, 1995.
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- ¹⁴⁶ Paper 6
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- ¹⁵⁰ Mohanty
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- ¹⁷³ Montek Ahluwalia, Practitioners in Development, World Bank, 2004.
- ¹⁷⁴ This section is based directly on the background paper by Usman Qamar, which draws on the following documents: Agriculture Operations Division, South Asia Regional Office, The World Bank, Project Completion Note : Indus Basin Project 1964 Supplemental Credit, May 1993, Irrigation I Davison, South Asia Project Department, The World Bank, Project Completion Report: Tarbela Dam Project, April 1984
Operations Evaluation Department, The World Bank, Project Completion Report: Tarbela Dam Project, September 1986, Operations Evaluation Department, The World Bank, Pakistan – On Farm and Command Water Management and Irrigation Systems Rehabilitation Projects, Environment and Social Development Sector Unit, Rural Development Unit, South Asia Region, The World Bank, Pakistan Public Expenditure Management : Accelerated Development of Water Resources and Irrigated Agriculture, Vol-II, January 2004.

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- ¹⁷⁵ Including seven IDA Credits for the former East Pakistan for a total amount of USD 3,832 million equivalent
- ¹⁷⁶ Usman Qamar background paper
- ¹⁷⁷ Subsequently the Bank also administered the Tarbela Development Fund.
- ¹⁷⁸ The OED PPAR for Tarbela dam also noted that “..agricultural benefits of Tarbela could be increased considerably if water supplies that are surplus to historical water rights could be allocated according to regional market demand (given enabling drainage investments in saline groundwater areas), rather than according to statute...”. The inter-Provincial Water Accord was ultimately signed in 1991.
- ¹⁷⁹ While the Lieftinck Report (1967) had advocated Tarbela dam as the center piece of the IBDP, it had also pointed to the need for coupling water development with agricultural development if the full benefits of water development were to be realized. Complimentary programs were to include rehabilitating, modernizing and expanding the existing irrigation systems and modernizing agriculture by wider use of technical inputs, improving water regulation practices and on-farm water management, reducing subsidies, increasing water charges, providing drainage and water quality management, and strengthening infrastructural support for agriculture.
- ¹⁸⁰ Until the early 1970s abiana proceeds were sufficient to cover the full operation and maintenance (O&M) cost and a small percentage of capital cost. However, the then government did not increase abiana rates even in nominal terms and recoveries fell far below O&M expenditures.
- ¹⁸¹ Expenditure on O&M of SCARP tube wells accounted for nearly 50% of the Punjab Irrigation Department’s annual O&M budget.
- ¹⁸² For example, the option of using evaporation ponds for saline effluent disposal was rejected based on the results of poorly sited evaporations ponds in SACRP VI. Evaporation ponds have been successfully used in countries such as Australia for disposing saline drainage effluent.
- ¹⁸³ Generally, original design criteria of the canal system had evolved to fit availability of water supplies in the rivers, to meet the objective of bringing to maturity the largest possible area of crops with the minimum consumption of water, and to operate at a low cost and with a limited number of technical staff. These resulted in low cropping intensities and low yields. While these irrigation schemes were historically very successful in generating agricultural surpluses at a time of low population densities and few technological demands, they have been less well adapted to the requirements of modern agriculture.
- ¹⁸⁴ It is important to clarify here that water losses in areas underlain with fresh ground water are not real losses as these losses simply recharge the aquifer for later usage. The only real savings in losses are those obtained in SGW areas.
- ¹⁸⁵ Other than emergency assistance for flood damage and operations already appraised by then.
- ¹⁸⁶ For example, not including the PIDs as participating agencies in the project while seeking to replace them with alternative bureaucracies
- ¹⁸⁷ Opponents of reforms wanted to create the impression that “the reforms had failed”; however, the opposing view is that actually the “agencies failed to reform”.
- ¹⁸⁸ With the exception of Sindh where the Bank had earlier approved an IDF grant for preparing an institutional development pilot project for the Nara Canal AWB.
- ¹⁸⁹ As part of this project, a draft framework for groundwater regulation in Punjab was also prepared.
- ¹⁹⁰ Including introduction of micro-irrigation technologies and piloting of volumetric water delivery and abiana on the basis of volumetric deliveries
- ¹⁹¹ World Bank. ICR for Ghazi Barotha Hydropower Project, June 2004.
- ¹⁹² World Bank. ICR for Ghazi Barotha Hydropower Project, June 2004.
- ¹⁹³ This section draws directly on a background paper by Pervaiz Amir and Nadir Abbas
- ¹⁹⁴ Andrew Balls, “World Bank under fire on spending priorities”, *Financial Times*, 20 May 2005.