



Validation Report

Reference Number: PVR-233
Project Number: 24268
Loan Number: 1146 (SF)
December 2012

Pakistan: Chashma Right Bank Irrigation Project (Stage III)

Independent Evaluation Department
Asian Development Bank

ABBREVIATIONS

ADB	–	Asian Development Bank
BME	–	benefit monitoring and evaluation
CRP	–	Compliance Review Panel
EIRR	–	economic internal rate of return
O&M	–	operation and maintenance
OFWM	–	on-farm water management
PCR	–	project completion report
PSCC	–	Project Supervision and Coordination Committee
RRP	–	report and recommendation of the President
WAPDA	–	Water and Power Development Authority

NOTE

In this report, “\$” refers to US dollars.

Key Words

adb, asian development bank, canal system, chashma right bank irrigation, employment, ied, independent evaluation department, infrastructure, pakistan, poverty alleviation, project completion report validation, rural development, water management

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PROJECT BASIC DATA

Project Number:	24268	PCR Circulation Date:	Dec 2010	
Loan Number:	1146 (SF)	PCR Validation Date:	Dec 2012	
Project Name:	Chashma Right Bank Irrigation Project (Stage III)			
Country:	Pakistan		Approved (\$ million)	Actual (\$ million)
Sector:	Agriculture and natural resources	Total Project Costs:	287.50	279.10
ADB Financing: (\$ million)	ADF: 185.00	Loan: (SDR equivalent)	185.00	187.27
	OCR: 0.00	Borrower:	135.38	
Cofinancier:	German development cooperation through KfW	Total Cofinancing:	62.50	53.01
			40.00	38.82
Approval Date:	17 Dec 1991	Effectiveness Date:	19 May 1992	19 Nov 1992
Signing Date:	19 Feb 1992	Closing Date:	30 Sep 2000	30 Jun 2011
Project Officers:	W. Arriens J. Bird P. Logan K. Matsunami T. Matsuo B. Tambunan	Location:	ADB headquarters ADB headquarters ADB headquarters ADB headquarters ADB headquarters ADB headquarters	
Validator:	J. Cook, Consultant	Peer Reviewer:	A. Morales, Evaluation Officer, IED1	
Quality Reviewer:	R. Sabirova, Evaluation Specialist, IED1	Director:	W. Kolkma, IED1	

ADB = Asian Development Bank, ADF = Asian Development Fund, IED1 = Independent Evaluation Department (Division 1), OCR = ordinary capital resources, PCR = project completion report, SDR = special drawing rights, SF = special funds.

I. PROJECT DESCRIPTION

A. Rationale

1. The project comprised stage III of the overall Chashma Right Bank Irrigation Project.¹ The project was to complete the irrigation infrastructure of the Chashma Right Bank Irrigation Project and included a number of additional components required to ensure that benefits attributable to the investment were realized. In 1991, at the time stage III was designed, the stage I main canal system had been commissioned, and the stage II main canal system was expected to be completed by the end of 1992. Subsequent project stages were intended to start immediately after the completion of each stage of the main canal system. Only 26% of the discharge capacity of the stage I segment, and about 20% of the stage II segment of the main canal were required to irrigate their respective command areas. The balance was to be

¹ ADB. 1991. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Technical Assistance to the Islamic Republic of Pakistan for the Chashma Right Bank Irrigation Project (Stage III)*. Manila. For a full background of the project stages I and II, please refer to the report and recommendation of the President (RRP).

conveyed to the stage III command area. A substantial portion of the cost for stages I and II was thus assignable to stage III.

B. Expected Impact

2. The project's expected impact in the report and recommendation of the President (RRP) was not clearly defined. The project was expected to contribute to the main thrust of the government's strategy for socioeconomic development—sustained growth with improved income distribution—and to a rural development program emphasizing employment and poverty alleviation. In accordance with the then prevalent general practice, the RRP did not provide a set of indicators and a project framework. The project completion report (PCR)² recognized the absence of a project framework as well.

C. Objectives or Expected Outcomes

3. Project outcomes were to increase agriculture production, job opportunities, and farm income in the project area by extending the main canal and irrigation system (commenced under stages I and II), and providing facilities for surface drainage and on-farm water management. A cultivable command area of about 47,000 hectares (ha) in the D. I. Khan district of the North-West Frontier Province (now Khyber Pakhtunkhwa) and about 88,000 ha in the D. G. Khan District of Punjab were expected to benefit under the project. The outcome was intended to be sustainable irrigated agriculture functions in the entire project area.

D. Components and Outputs

4. The project comprised four packages:

- (i) **Part A:** Main canal and related structures—including 142 kilometers (km) of the 270 km right bank main canal with a capacity of 79 cubic meters per second (m³/s) at the start of the stage III area and related flood control facilities
- (ii) **Part B:** Distributary and minor canals and surface drainage—distributary canals totaling 500 km (with associated roads) and surface drainage facilities
- (iii) **Part C:** On-farm water management (OFWM)—around 135,000 ha with 2,750 km of canals
- (iv) **Part D:** Agriculture and livestock extension

E. Provision of Inputs

5. The total project cost was estimated at \$287.5 million, including a \$185 million Asian Development Bank (ADB) loan (64%),³ government contribution of \$62.5 million (22%), and cofinancing of \$40 million (14%) from the German development cooperation through KfW, a German government development lending agency. The project implementation period was estimated to take 8 years, from 1992 to 2000. The loan came from the Asian Development Fund and was repayable in 35 years, including a 10-year grace period and a service charge of 1% per annum.

² ADB. 2010. *Completion Report: Chashma Right Bank Irrigation Project (Stage III) in Pakistan*. Manila.

³ The PCR was completed when the project was not yet financially closed. Based on ADB's Loan and Financial Information Systems, total ADB Loan was \$191.6 million when the project closed financially in June 2011.

6. Consulting inputs were estimated at 1,800 person-months (456 international and 1,344 national) of long-term professional services, and 60 person-months of specialized short-term consultant inputs. Actual usage was 455 person-months for international consultants and 4,941 person-months for national consultants, including support staff. The PCR noted that in terms of person-months, the national consulting inputs used were 3.7 times the appraisal level.

7. ADB provided a \$1 million technical assistance for strengthening environmental management for water resources development. The technical assistance focused on institutional strengthening, with two main objectives: (i) to create technical capacity in environmental management within Pakistan's Water and Power Development Authority (WAPDA), and (ii) to recommend an appropriate environmental institutional framework.

F. Implementation Arrangements

8. The WAPDA was responsible for executing Parts A and B of the project, including approval of detailed design and construction of all irrigation and drainage works. The provincial governments of Khyber Pakhtunkhwa and Punjab were responsible for Part C (OFWM) and Part D (agriculture and livestock extension). The WAPDA project director was assisted by four provincial project coordinators, two from each provincial government. The Project Supervision and Coordination Committee (PSCC), established under stage I, continued under stage III with responsibility for overall supervision and coordination of project activities. Chaired by the Secretary of the Ministry of Water and Power, the PSCC comprised representatives from the Ministry of Food, Agriculture and Cooperatives; provincial governments; and the WAPDA.

II. EVALUATION OF PERFORMANCE AND RATINGS

A. Relevance of Design and Formulation

9. The PCR noted that project design was consistent with Pakistan's development priorities at that time and ADB's lending strategy in agriculture and irrigation. Lessons learned from the implementation of project stages I and II, and the WAPDA's experience in Pakistan's water sector were (partly) incorporated into project design. About 54% of the discharge capacity of the main canal was to be conveyed to the stage III command area, and the full benefit of the project could only be achieved after completion of stage III (PCR, para. 6). This validation adds that the project was consistent with ADB's country program on supporting poverty reduction through provision of assistance in key strategic areas of good governance, sustainable pro-poor economic growth, and inclusive social development, with good governance being the primary theme of the subsequent strategy.⁴

10. This validation finds that the project design followed through logically from stage II. However, there were serious deficiencies that later had negative impact on the project. Notable was the failure to account adequately for flooding from the hills to the west of the main canal, for which appropriate floodways were not designed. According to the PCR, this ultimately led to the need to protect communities to the west of the main canal from exacerbated flooding—a major source of grievance—and consequently, to the design of a flood torrents project to put local river flows to productive use. The issue of flooding reemerged after the devastating floods in early August 2010. The floods damaged the main canal at 17 locations and its distribution system at several locations. Water supplies were restored quickly, but a \$2 billion rehabilitation program was needed in 2010. To reduce the impact of flooding, the main canal alignment was moved

⁴ ADB. 2003. *Country Strategy and Program Update: Pakistan, 2004–2006*. Manila.

higher, adding around 30,000 ha to the area below the canal, which could not then be gravity irrigated. This created inequity within the project area, a situation which should, perhaps, have been prevented already during project design, e.g., by shortening the main canal.

11. While the project and its objectives are considered *relevant* in principle, this validation found several weaknesses: (i) the project made an inadequate assessment of the impact of local flooding on areas west of the main canal; (ii) it did not adequately address the implementation of ADB social and environmental safeguards at the earliest stage of the project approval, as pointed out by the final report of the Compliance Review Panel in June 2010 (footnote 6); and (iii) it applied a traditional approach to irrigation system design, rather than an integrated basin management approach although it did rely on consultation with farmers organization. When assigning a *relevant* rating, the validation recognizes that implementation of the inspection regime and funding from loan proceeds did allow correction of many of the worst impacts of the project.

B. Effectiveness in Achieving Project Outcomes

12. Based on information in the PCR, the project attained its objective of increasing and diversifying agriculture production and raising farm income in the project area. An area of 135,000 ha has been supplied with full irrigation, although considerable areas at the tail of distributaries face the risk of inadequate supply due to poor canal maintenance, planting of high water demand crops, and inefficient irrigation in head areas. Cropping intensity is estimated at 110% and is expected to further increase in the future, subject to effective implementation of infrastructure maintenance. Cropping intensity remains significantly less than the appraisal estimate of 150%. Before the project, the area was partly irrigated by tubewells (8,300 ha) and partly rainfed and/or inundated by seasonal floods (126,700 ha). The average cropping intensity of 12% covering the whole area suggests an increase in total cropped area by 800%, which was attributed to the project. The current cropping pattern is different from what was projected. The relative importance of cash crops (sugarcane and cotton) increased compared with food crops (paddy and wheat) and fodder crops (PCR, paras. 44–45). Furthermore, farm budget analysis estimates in 2010 for a 3 ha farm earned \$1,565 relative to \$610 for the same farm size under a without-project scenario. The livestock component was not effective, considering low disbursement. The PCR did not rate project effectiveness. Based on information in the PCR, this validation assesses the project as *effective*.

C. Efficiency of Resource Use in Achieving Outcomes and Outputs

13. The PCR noted that the project was complex, involving 10 federal and provincial agencies, and requiring a coordinated and integrated management approach. A review of project records revealed that major delays had been experienced in activities such as canal design, benefit monitoring and evaluation (BME) consultancy, establishment of effective provincial coordination and monitoring units, and investigation and resolution of the flooding issue, approval of government budgets (PC-1s) for Parts C and D, and briefing materials were incomplete for the various coordination forums such as the provincial coordination committees and the PSCC. KfW was dissatisfied with progress after about 40 months of implementation and threatened to withdraw from the project if performance did not improve. The withdrawal did not materialize.

14. Despite implementation delays and the design modifications necessitated by cost overruns, the project ultimately managed to develop irrigation and drainage facilities for the entire command area of 135,000 ha proposed at appraisal—an area that was largely barren and

unproductive. The PCR calculated project economic internal rate of return (EIRR) at 14% compared to 20% estimated at appraisal. The lower EIRR derives from (i) the current cropping pattern, (ii) a lower level of cropping intensity, (iii) lower economic gross margins for major crops, and (iv) the extended construction period. If the cropping pattern and cropping intensity expected at appraisal had been achieved by 2010, the EIRR would have been 18%. This highlights the need for improved operation and maintenance (O&M) to ensure adequate delivery of water to enable cropping intensity to continue to rise (PCR, para. 46). The PCR's calculation of EIRR allows \$270,000 per year for O&M, or \$2/ha or 0.5% of crop gross margin (PCR, Table A7.4). In the view of this validation, this is far too low and would lead to a need for major rehabilitation within a few years. Although total project cost did not exceed appraisal estimates, the PCR noted that some project components have significant cost overruns. Appendix 2 of the PCR indicates that in the civil works component alone, actual costs reached \$208 million, which is 44% more than the \$145 million estimated at appraisal. The PCR did not provide a categorical rating for overall project efficiency but an *efficient* rating is implied in the discussion. This validation finds that although the EIRR is higher than 12%, process efficiency has been an unusually large challenge, resulting in the need for an inspection and subsequent significant delays. Given the foregoing, this validation assesses the project *less than efficient*.

D. Preliminary Assessment of Sustainability

15. In its assessment of project infrastructure, the PCR mission indicated that the general condition of the irrigation and drainage system was satisfactory. However, the mission also identified concerns relating to growth of vegetation and siltation in flood carrier channels and unlined distributary canals, which reduced flow rates. The WAPDA is responsible for O&M of the main canal and distributary off-takes for stages I, II, and III of the project and provincial irrigation departments are responsible for distributary and minor canals. Despite clearly defined cost-sharing agreements between the WAPDA and the provincial governments, the provinces did not provide adequate funds to the WAPDA, resulting in part from poor collection of water charges from farmers.

16. The under-funding of O&M had serious implications for project sustainability, which is less than likely, and for the extent to which irrigation intensity can be further increased toward the appraisal target of 150%. The PCR stated that provincial governments have now fully recognized the importance of O&M and the need for significant cost recovery from project beneficiaries, and they have introduced fundamental changes in their water sector policies. Reforms also included the transfer of part of the responsibility for O&M to farmers' organizations (PCR, paras. 47–49). Given the foregoing, the PCR assesses project sustainability as *less than likely sustainable*, with which this validation concurs.

E. Impact

17. Through increasing cropping intensity and changing cropping patterns, the project has had a marked socioeconomic impact in the area. The PCR indicates that population in the project area has increased from 378,000 at appraisal to 935,000 in 2009 (PCR, para. 51). In 1991, there were 34,000 farms in the project area with an average size of 4.0 ha. Estimates for 2010 indicate that the number of farms has increased to 41,150 and the average size lesser at 3.0 ha. Over the same period, average household income has risen from about \$550 to \$2,350, with 67% derived from crop production. This greatly exceeds the prevailing poverty line income of around \$200 per person per year (or \$1000 per household) and is four times higher than the estimated farm income without the project at the time of appraisal. Increased availability of fodder has encouraged an expansion in livestock husbandry, resulting in both higher incomes

and an improved diet for the local population. Drinking water facilities have also improved and become more reliable. Project monitoring did not estimate impacts on women. However, increased household income and improved access to water suggest a substantial net benefit to women in the project area.

18. The institutional impact of the project has been limited. No farmers' organizations were established in Khyber Pakhtunkhwa, and the 30 organizations that were established in Punjab were only partially successful, since they have not been effective in assessing and collecting water charges. Although a sound framework was established for cooperation between the WAPDA and the provincial governments with respect to the responsibilities and sharing of O&M costs, this has not been effectively implemented. The opportunity to build the capacity of project area farmers and, to some extent, provincial agriculture and livestock extension services, was not fully realized since Part D was cut back.

19. The PCR indicates that the project has had no major adverse environmental effects (PCR, para. 53). However, this validation considers this incorrect. At least two significant environmental impacts were experienced: (i) the flooding of land and villages above the main canal, and (ii) salinization of irrigated lands—reported by the review mission in November 2000, which also reported that significant areas of the stage I development were salinized. Proper care will be required to improve water management, and to upgrade on-farm and interfarm drainage to avoid salinization causing more widespread land degradation. The project's response to issue (i) was to move the main canal to a higher elevation, which reduced the impact of flooding from hill torrents and allowed their management. The WAPDA attempted to mitigate the effect by introducing pump-based schemes, but this was limited in scale and expensive for the farmers. Nonetheless, some issues were mitigated during the compliance review period. The project contributed significantly to area development. Based on the discussions above, this validation assesses project impact as *significant*.

III. OTHER PERFORMANCE ASSESSMENTS

A. Performance of the Borrower and Executing Agency

20. The PCR rated the borrower's performance during implementation as *satisfactory*, although implementation faced numerous difficulties in staffing, coordination, procurement, and local (PC-1) budgeting (PCR, para. 40). Overall local funding was adequate, although 15% below target. Regular PSCC meetings were held. At the end of the project, a key issue of concern was the under-funding of O&M and poor recovery of water charges, which are critical for the sustainability of the project. The WAPDA's performance as executing agency was generally satisfactory. It coordinated well with ADB and KfW, provincial governments, the consultants, and contractors. It supported ADB missions and provided unrestricted access to project records. However, the WAPDA's performance with respect to selection and appointment of consultants and evaluation of bids was generally not satisfactory, taking longer than expected. The performance of the provincial governments in the execution of their respective parts in the OFWM component was satisfactory. Their performance in implementation of the agriculture and livestock extension component was less than satisfactory as the component was not fully implemented. This validation concurs with the PCR rating of *satisfactory*.

B. Performance of the Asian Development Bank

21. The PCR noted that ADB supervised the project intensively, with 45 missions set out both independently and jointly with KfW, including 6 review missions from July 1989 to February

1993 to assist the WAPDA in project start-up (PCR, para. 42). ADB played a key role in the reformulation of the project both when initial cost overruns were identified, and when grievances were raised by people affected by the project (PCR, para. 10). It also maintained a positive relationship and close coordination with the WAPDA, provincial governments, and KfW. However, ADB was unable to prevent the initial delays in the appointment of consultants. During implementation, the project faced difficulties, ultimately leading to the need for an official panel inspection of the project and rectification of issues relating to resumption, resettlement, environmental damage, and failure to follow ADB policies. ADB was initially unable to persuade the WAPDA to take the necessary measures. However, by the much-extended completion of the project, the Board of Inspection deemed the project to have substantially complied with the defined rectification measures.⁵ This validation rates ADB performance as *satisfactory*, the same rating given by the PCR.

C. Others

22. The project has an Environmental Management Plan, which was to be implemented in two phases. Phase 1 has been fully implemented while only the environmental awareness and afforestation programs had been implemented in phase 2 as of the closing date of December 2009. Programs not implemented include the following: (i) conservation of wildlife, (ii) a salinity management plan, (iii) a socioculture program, and (viii) strengthening the role of women in development.

IV. OVERALL ASSESSMENT, LESSONS, AND RECOMMENDATIONS

A. Overall Assessment and Ratings

23. The PCR rated the project *successful*, taking into account all the extra work that the project was compelled to do following ADB's acceptance of the inspection panel's recommendations in 2004. This validation reduced the relevance mainly due to design issues. The efficiency rating was also downgraded given unsatisfactory performance in terms of process efficiency and the visibly high cost overrun in the civil works component. Unfortunately, the downgrades resulted to an overall validation rating of *less than successful* (see table).

Overall Ratings

Criteria	PCR	IED Review	Reason for Disagreement and/or Comments
Relevance	Highly relevant	Relevant	Several design issues reduced project relevance (para. 11).
Effectiveness in achieving outcome	No rating	Effective	Based on the information given in the PCR and in accordance with PCR validation guidelines (para. 12).
Efficiency in achieving outcome and outputs	Efficient (Implied)	Less than efficient	There is no summary descriptor of overall efficiency rating. Process efficiency is modest resulting to delays and there is a significant cost overrun in the civil works component (para. 14).

⁵ The final report of the Compliance Review Panel (CRP) in June 2010 noted that ADB had fulfilled 24 of the 29 Board-approved recommendations. Four recommendations are still in partial compliance, but enough progress has been made so that they need not be monitored further by the CRP.

Criteria	PCR	IED Review	Reason for Disagreement and/or Comments
Preliminary assessment of sustainability	Less likely sustainable	Less than likely sustainable	
Overall assessment	Successful	Less than successful	An aggregation of the individual ratings.
Borrower and executing agency	Satisfactory	Satisfactory	
Performance of ADB	Satisfactory	Satisfactory	
Impact	Positive socioeconomic impact	Significant	Refer to para. 19.
Quality of PCR		Satisfactory	Refer to para. 28.

ADB = Asian Development Bank, IED = Independent Evaluation Department, PCR = project completion report.

Note: From May 2012, IED views the PCR's rating terminology of "partly" or "less" as equivalent to "less than" and uses this terminology for its own rating categories to improve clarity.

Source: ADB Independent Evaluation Department.

B. Lessons

24. The PCR identifies a number of useful lessons, with which this validation concurs. In addition, this validation notes the inefficient and ineffective compensation process for land resumed. It is essential that adequate compensation mechanisms are built into the project design and implemented. If this had been undertaken, it might have preempted the need for a protracted and expensive system for redressing grievances. Rapid compensation is highly desirable. If compensation is delayed, land values may increase and resettlers may no longer consider defined compensation rates to be adequate.

C. Recommendations for Follow-Up

25. The PCR makes some relevant project-related recommendations, which this validation supports (PCR, paras. 57–63), including farmer awareness and training, O&M funding, and future monitoring. This validation also agrees with the PCR's general recommendations concerning O&M and cost sharing to ensure sustainability, realistic estimation of civil works contract packages to avoid frequent revisions, and recruitment of project implementation consultants before loan negotiations to minimize delays in project start-up.

V. OTHER CONSIDERATIONS AND FOLLOW-UP

A. Monitoring and Evaluation Design, Implementation, and Utilization

26. Project monitoring was performed in two stages: (i) during main implementation, and (ii) during post construction as part of the inspection process. During the project period, the PCR concludes that BME was adequate as per the then prevalent general practice, insofar as all relevant covenants were complied with. However, the PCR provides no indication of the quality of BME. Project implementation monitoring and evaluation consultants were only appointed in August 1998, after 6 years of implementation and only 2 years from scheduled completion. Moreover, the provinces had difficulty contracting consultants, which is surprising considering the project's third stage.

27. In November 2002, some affected people supported by nongovernment organizations filed a request for inspection of the Chashma project with ADB's Board Inspection Committee.

ADB's Board considered the committee recommendations and directed ADB to discuss with the government the possibility of extending the project completion date and using surplus loan proceeds to address the most significant of the remaining problems. The Board mandated the Compliance Review Panel (CRP) to monitor implementation of project-specific remedial actions. The CRP prepared and issued annual monitoring reports from 2005 to 2009. After 5 years of monitoring, the CRP concluded that ADB had complied with 24 of the original 29 recommendations while 1 had already been superseded by events. For the four partially complied recommendations, the CRP concluded that sufficient progress had been made, and under the circumstances, further monitoring was no longer needed.

B. Comments on Project Completion Report Quality

28. This validation assesses the PCR quality as *satisfactory*. It contains detailed information on the history, implementation, and performance of the rather complex project. It has good lessons and recommendations. Nonetheless, while assessments can be inferred, the text does not specifically use the terminology of the prescribed evaluation methodology.

C. Data Sources for Validation

29. Data sources for this validation consist of (i) the project's RRP, (ii) related project documents and correspondence, (iii) ADB PCR, (iv) government PCR, and (v) the project's inspection request and compliance review monitoring reports.

D. Recommendation for Independent Evaluation Department Follow-Up

30. No Independent Evaluation Department follow-up is recommended based on the CRP report conclusion that there is no compelling reason or policy consideration for monitoring beyond 5 years.