Report Number : ICRR0020802

1. Project Data

Project ID P098078	**Project Name** CN-Huai River Basin Flood Management an.
Country China	**Practice Area(Lead)** Water

L/C/TF Number(s)	Closing Date (Original)	Total Project Cost (USD)
IBRD-79380	31-Dec-2016	597,410,000.00
Bank Approval Date	**Closing Date (Actual)**	
06-Jul-2010	31-Dec-2016	

	IBRD/IDA (USD)	Grants (USD)
Original Commitment	200,000,000.00	0.00
Revised Commitment	200,000,000.00	0.00
Actual	200,000,000.00	0.00

Prepared by	Reviewed by	ICR Review Coordinator	Group
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2. Project Objectives and Components

a. Objectives

Two Financing Agreements (FAs, p.4 and p.1) and the Project Appraisal Document (PAD, paragraph 9) state that the project development objectives are:

1. to provide better and more secure protection from floods and water logging
2. to increase farm land productivity
3. to reduce property losses in predominantly rural areas in the Huai River basin in the provinces of Anhui, Henan, Jiangsu, and Shandong.

The key outcome indicators (PAD, paragraph 10, ICR, paragraph 8) are:

1. rural and urban areas protected from flooding or water logging
2. number of people protected from flooding or water logging
3. reduced economic losses in areas protected from flooding or water logging
4. increase in per capita agricultural incomes of farmers
5. increased navigation benefits from river improvements

b. Were the project objectives/key associated outcome targets revised during implementation?

No

c. Will a split evaluation be undertaken?

No

d. Components

1. **Flood Protection and Drainage Improvement**: (US$ 186.46 million at appraisal, loan fully disbursed, US$ 349.51 million actual inclusive of counterpart funds). This component financed construction to strengthen dikes, improve waterways by dredging, excavating drainage channels, reinforcing and stabilizing river banks and rehabilitating, replacing and expanding flood control works such as pumping stations, cross dike structures, sluice gates and bridges. In addition, this component financed the establishment and expansion of 36 Farmer Drainage and Irrigation Associations (FDIAs) and a program to mitigate adverse environmental impacts and enhance positive impacts from this component.
2. **Disaster Assessment and Support System** ((US$ 9.23 million at appraisal, fully disbursed, US$ 24.89 million actual inclusive of counterpart funds). This component financed the upgrading of data collection on river floods and drainage, improved speed of disaster information data collection, transmission, and processing, established a disaster assessment center in Hefei in Anhui Province, which included participatory decision making processes and innovative waterlogging mitigating measures.

3. **Institutional Strengthening** (US$ 2.02 million at appraisal, fully disbursed, US$ 3.63 million actual) This component financed training and technical assistance studies covering dike maintenance, design and construction of flood control projects, modern construction technologies, data collection and decision support systems for flood forecasting systems, emergency preparedness plans, and river modeling, and project management of completed works. In addition, this component financed studies and construction of physical assets for the efficient operations and maintenance of flood control and drainage improvement facilities of project implementing entities.

4. **Resettlement Action Plan Implementation**: (US$ 0 million at appraisal, US$ 165.35 million actual, all from counterpart funds) This component financed the implementation of a program to resettle and rehabilitate project-displaced people.

5. **Project Management**: (US$ 1.79 million at appraisal, fully disbursed, US$ 62.97 million actual, inclusive of counterpart funds. NB: the Government increased its counterpart funds allocated to this component to address the depreciation of the US$ against the RMB and address the initial lack of counterpart funds from one province and all the cities and counties of the four provinces - see ICR, footnote 10). This component financed training and technical consulting services to support the project implementing entities in engineering design, preparing and processing procurement documents, construction supervision, installing and operating a procurement and financial management information system (MIS), establishing a monitoring and evaluation (M&E) systems and support to carry out this project specific M&E system as well as quality assurance measures.

e. Comments on Project Cost, Financing, Borrower Contribution, and Dates

Project Cost: The project cost was appraised at US$ 597.41, inclusive of counterpart financing with a loan of US$ 200 million, which included the front end fee of US$ 0.5 million. Total project cost reached US$ 613.77 million, with the loan 100% disbursed. There were considerable savings from competitive bidding (lower costs), cancelled study tours due to Government restrictions on foreign travel, and training activities funded by the Government rather than loan proceeds which resulted in reallocating savings to existing expenditure categories.

Financing: The International Bank for Reconstruction and Development financed this Specific Investment Loan. Two FAs, covered this loan - the first between the World Bank and the Government of China, and the second, a Project Agreement between the Bank and the implementing entities - the provinces of Anhui, Henan, Jiangsu, and Shandong and the Huai River Basin Commission.

Borrower Contribution: There were no borrower contributions. The ICR states that the Government committed to providing US$ 397.41 million in counterpart funds at appraisal and disbursed US$413.77 actual by project close.

Dates: The project was completed as scheduled, on December 31, 2016. A Mid Term Review was conducted in 2013 but approved by the Borrower 11 months later on November, 2014 (ICR, paragraph 32). There was a level 2 restructuring, which did not require Board approval. The restructuring resulted from loan savings due to procurement efficiencies, cancelled study tours, and training activities that were self-funded instead. The restructuring reallocated loan proceeds between expenditure categories, revised disbursement ratios of civil works categories, and revised disbursement percentages retroactive to November 2012 (ICR, paragraph 33).

3. Relevance of Objectives & Design

a. Relevance of Objectives

The project objective is relevant to China's 13th Development Plan (2016-2020), particularly in its efforts to

strengthen water security and implement a comprehensive flood control and mitigation systems (Part VII, Chapter 31, Section 2). The objective is also relevant to the country's planned support for the central region, to strengthen the protection and improvement of water environments and promote the development of ecological economic zones such as the Huai river ecological economic belt (Part IX, Chapter 37, Section 3). The Huai River is part of the focus of strategic agricultural development based on the 23 agricultural belts within the seven agricultural production zones (i.e., the northeast plains, the Yellow-Huai-Hai river plain, the Yangtze River basin, the Fen-Wei river plain, the Hetao irrigation area, southern China, and the Gansu-Xinjang region) (Part X, Chapter 42, Section 1).

The project objective is also highly relevant to two of three engagement strategies that would implement the World Bank's Country Partnership Strategy 2013-2016 (CPS, paragraph 36). One, in ***Supporting greener growth,*** **t**he project directly supports the Bank's efforts to help China enhance urban environmental services (CPS Outcome1.2, paragraph 50) by helping cities build resilience to natural disasters such as floods and integrating cultural heritage conservation and sustainable local development; promote sustainable agriculture practices (CPS Outcome 1.3, paragraph 52) by expanding China's ability to adapt to climate change; as well as strengthening mechanisms for managing climate change by demonstrating sustainable and climate-resilient agricultural production and risk management systems. In addition, the project development objective contributes to Outcome 1.5, demonstrating sustainable natural resource management approaches by implementing water resource management at the river basin level (CPS, paragraph 53 and Annex 1). Two, in ***Promoting more inclusive development,*** the objective contributes to enhancing opportunities in rural areas and small towns by boosting rural incomes and reducing poverty (CPS Outcome 2.3, paragraph 62); and help improve transport connectivity for a more balanced regional development (CPS Outcome 2.4, paragraph 63).

Rating
High

b. Relevance of Design

The project design and its activities were consistent with the project's objectives (PDOs). The PDO was clear and realistic. This ICR Review deconstructs the formally stated PDO into three objectives: the first, to provide better and more secure protection against floods and water logging, the second to increase farm land productivity, and the third, to reduce property losses in predominantly rural areas in the Huai River basin in the provinces of Anhui, Henan, Jiangsu, and Shandong.

The Results Framework causal chain laid out the logical outcome of the five components - infrastructure activities, institutional development, and capacity strengthening - in support of the project development outcome (PDO). Five PDO indicators were supported by 13 intermediate outcome indicators. The first and second outcomes - rural and urban areas, and the number of people protected from flooding or water logging - were to be evidenced from the number and measure of structures along the river basin such as length of dikes strengthened, length of river dredged, and pumping stations, culverts, and bridges constructed, the number of FDIAs established, the number of approved and implemented operations and maintenance (O&M) plans, and the number of officials who disseminated the project's innovations. The third, fourth, and fifth

outcomes - reduced economic losses in areas protected from flooding or water logging, increased per capita agricultural incomes of farmers, and increased navigation benefits from river improvements - were to be evidenced by the number of implemented major actions from the Environmental Management Plans, investments in flood disaster assessment and decision support system, investments in the use of the hydraulic model, accuracy in flood forecasting, and the number of resettled people whose incomes and lives were improved.

The ICR points out that two intermediate outcome indicators (no. 8 - percent of investments on the hydraulic model, and no. 9 - accuracy of flood disaster assessment and decision support reflected in the predicted error between estimated and actual inundated area) would have been better reflected as physical attributes (e.g., the number of investments that used the hydraulic model) (ICR, paragraph 34). This shortcoming, however, did not detract from the soundness of the Results Framework.

Rating
Substantial

4. Achievement of Objectives (Efficacy)

Objective 1

Objective
To provide better and more secure protection against floods and water logging

Rationale
OUTPUTS:

- Exceeded all targets (there was no available baseline data provided) relative to 444.62 km. of dikes constructed (target 417.45 km.); 1,023.51 km. of river dredged (target 980.54 km.); 252 irrigation and drainage pumping stations constructed (target 182 units); 487 sluice gates/culverts constructed (target 427); 250 bridges built (target 197), and carried out 100 action programs (target 59) to mitigate the adverse impacts and enhance positive impacts of the project.
- Established 36 FDIAs (target 36, met); and approved and implemented 151 O&M plans (target of 146 exceeded because of an increase in the number of structures due to cost savings)
- Excavated or rehabilitated 140.88 km. of drainage ditches (no target established at appraisal because these were to be determined in consultation with farmers during implementation (ICR, Annex 2 paragraph 2).
- Met the target of completing the construction of an information collection system for the Huai River and constructed the Yu-Shu-si river flood disaster surveillance base and acquired equipment
- Developed an information and data collection monitoring subsystem for the following: Xinyang in Hunan Province; Suquian, Xuzhou and Hunana in Jiangsu Province; Huainan hydrologic monitoring station at

Fuyang in Anhui Province; and Zaozhuang in Shandong Province.
- Established a disaster evaluation model, flood disaster assessment and support system in Huai River Basin assessment centers
- Completed studies to formulate innovative measures on waterlogging mitigation and strategies.
- Conducted training for a total of 9,412 participant days in project management, environmental management, resettlement, financial management, operations and maintenance and managing associations. In addition, 830 participant days were spent in domestic study tours to other river basin commissions and 522 participant days in overseas study tours, including a visit to the Netherlands flood management facilities.

OUTCOMES:

- The outcomes exceeded targets. A total of 9,682.4 square km. of rural and urban areas were now protected from flooding (target 9,576.2 square km.), and 7.43 million people were protected from flooding (target 6.54 million).
- Incomes were improved for 81,311 project affected people (target of 57,173 exceeded, and maintained for another 4,884 people for whom resettlement was required (original target of 7,044 was reduced and met owing to improved engineering design that avoided resettling some of the people).
- A hydraulic model for irrigation and drainage developed under the project was in use (target achieved). Investments for flood disaster and decision support system were achieved and the planned accuracy of the system was achieved. Annex 10 of the ICR notes that the Huai River Basin flood disaster assessment system was an innovative technical breakthrough (ICR, paragraph 4, Annex 10).
- From the data collection rate from telemetering remote stations, errors between computed and actual inundated areas, and errors between forecasted and actual flood peak of less than 0.2 - 0.3 meters were achieved. However, there was nothing to report against the target for the error between computed and actual inundated areas because there was no major disaster during the implementation period.

Rating
Substantial

Objective 2
Objective
To increase farm land productivity

Rationale
OUTPUTS:
The outputs under Objective 1 were also relevant in meeting this objective.
OUTCOMES:

- With improvements in irrigation and drainage, advisory (agricultural extension) services, and improved seeds (new technologies introduced), outcomes under this objective were exceeded: per capita agricultural income increased to RMB 260 per year (target RMB 233 per year), navigation benefits supported the mobility of agricultural inputs and products, and increased commerce in the four provinces worth RMB 263.33 million (target RMB 118.41).
- All 36 FDIAs were functioning, strengthened by training in management and O&M. The autonomous FDIAs are responsible for O&M, and have embraced awareness raising and transparency of their actions, which increased farmers' commitment to pay water charges. As a result, FDIAs were able to collect cost efficient charges for water use. Multifunctional stations were used for drainage during the wet season and irrigation during the dry season, contributing to higher yields and incomes in poor rural areas and improved water regulation (ICR, footnote 22, paragraph 55, and footnote 29 of Annex 10, paragraph 7).
- Navigability of intricate secondary river channels improved transport of agricultural inputs and outputs and benefited from awareness campaigns directed at shifting production activity from traditional low-value grain to higher value cash crops.
- Optimal engineering designs reduced the number of people to be resettled from 7,044 to 4,884 people with improved incomes.

Rating
Substantial

Objective 3
Objective
To reduce property losses in predominantly rural areas in the Huai River basin in the provinces of Anhui, Henan, Jiangsu, and Shandong.

Rationale
OUTPUTS:
The outputs under Objective 1 were also relevant in meeting this objective.
OUTCOMES:
Economic losses (agriculture products and property) attributable to flooding were reduced by RMB 797.99 million (target RMB 699.45). Savings from efficient and competitive bidding, cancellation of study tours, and self-funding some of the training, funded additional works that contributed to exceeding the target. In addition, the ICR claims property losses were further reduced by a diversification of incomes through livelihood activities such as aquaculture (not documented) because of less flooding (ICR, paragraph 58).

Rating
Substantial

5. Efficiency

Economic and Financial Efficiency: The ICR provides an extensive comparison of the methodology and the resulting cost benefit analysis of the project used during appraisal and at project close (Annex 3). The analysis showed a summary ERR at appraisal of 20% and at project close of 25% (ICR, p.31). An ERR for each province was also presented ranging from 18-28% at project close compared to 17-22% during appraisal. The assumptions provided were adequate. The PAD assessed costs of flooding and water logging using historical data and applied a "with" and "without the project" condition to determine cost savings from reduced flooding attributed to the project.

Separate analyses also gauged the economic viability of key non-structural components of the project (flood disaster assessment and support system, on-farm drainage management piloted under the FDIAs. The analyses at appraisal indicated an ERR of 23 % for the flood disaster assessment and support system while the ERRs for the FDIAs in the four provinces ranged between 21 to 63% (also at appraisal). At a discount rate of 12%, the ERR for each provincial sub-project FDIA at appraisal ranged from 17-21% (PAD, paragraph 31). The ICR adequately presents a financial analysis using crop budgets and farm models under a "with" and "without" the project assumptions and show income increases from on-farm works for irrigation/drainage (ICR, Annex 3, paragraph 27)

Administrative and Operational Efficiency: Just-in-time capacity strengthening in procurement and contract management contributed to operational efficiency. Competitive bidding and optimal design considerations arising from beneficiary consultations resulted in loan savings to finance additional works. Exchange of experiences among the various implementing entities, facilitated by the Central Project Management Office (CPMO), helped support those entities that were less familiar with Bank procedures and contributed to operational efficiency. Additional counterpart financing was required in the early part of implementation because of the depreciation of the US$ against the RMB. The US$ re-appreciated against the RMB toward project close. Significant operational inefficiencies derived from a combination of factors. One was a lack of counterpart funds in Henan province and at the city and county levels in all four provinces at project start delaying initial disbursement. However, the ICR reports that the Government addressed this inefficiency (ICR, paragraph 31). Another was that the MTR was approved by the Government after an 11 month delay which led to delayed restructuring. However, the project restructuring addressed the issue of freed-up resources and adjusted disbursement ratios among expenditure categories. The project was closed as scheduled and fully disbursed.

Efficiency Rating
Substantial

a. If available, enter the Economic Rate of Return (ERR) and/or Financial Rate of Return (FRR) at appraisal and the re-estimated value at evaluation:

	Rate Available?	Point value (%)	*Coverage/Scope (%)
Appraisal	✓	20.00	56.00 ☐Not Applicable
ICR Estimate	✓	25.00	61.00 ☐Not Applicable

* Refers to percent of total project cost for which ERR/FRR was calculated.

6. Outcome

The relevance of objective is high and of design is substantial. Efficacy of all three objectives is substantial even though evidence was lacking to support the claim that property losses were reduced because of diversified incomes from aquaculture. Efficiency in economic, and financial terms, was substantial. Minor shortcomings in achieving the operation's achievements of its objectives revolved around administrative inefficiencies cited above.

a. Outcome Rating

Satisfactory

7. Rationale for Risk to Development Outcome Rating

The following pose risks to sustaining the project development outcome:

- Technical. The risk that the hydro modeling introduced by the project may not be sustained. This risk was mitigated by the continued use of the model. The ICR claims that outputs of the model are used in the design of new projects elsewhere in the country (ICR, footnote 13, paragraph 45, and Annex 10).
- Financial. The risk that there will be insufficient O&M resources for the irrigation and drainage infrastructures maintained by the FDIAs was mitigated by established O&M procedures and commitments made even before the delivery of the key infrastructure and facilities in line with new government regulations. In addition, the cost recovery and water pricing mechanisms instituted by the FDIA increased farm incomes and served as an incentive for optimizing water fee collection. Local government budgets included a specific budget line for O&M of the infrastructure projects.
- Environmental losses and exposure to natural disasters. This risk is mitigated by the adoption of the disaster assessment and support system implemented by the trained and experienced staff of the Huai River Basin Commission. This disaster assessment system was reported to be a technological breakthrough and was to be replicated in other watersheds and provinces in China (ICR, Annex 10, paragraph 4). A multi-sourced monitoring system was in place, which used near real-time river basin monitoring using advanced

remote sensing techniques.
• Ownership by the Government and stakeholders. FDIAs were new institutions and autonomous by design but also require Government support. The Government agreed to measures to support FDIAs after project close but a modest risk of future disengagement remained.

a. Risk to Development Outcome Rating
Modest

8. Assessment of Bank Performance

a. Quality-at-Entry
The Bank formulated the design of the project by combining structural (physical infrastructure) and nonstructural (flood modeling, disaster preparedness, institutional strengthening) solutions to address flood and drainage problems affecting four provinces along the Huai River Basin. Lessons from similar operations informed the design of this project (PAD, paragraph 13) , including the following project preparation activities:

- for effective and efficient project administration: reaching agreement on detailed organization and staffing arrangements for project coordination, management, and implementation, to ensure strong links between project management offices and administrative departments; implementing an action plan to address institutional gaps in project management; procuring major civil works and awarded after loan effectiveness;
- for sustainable project investments: committing counterpart funds and minimizing contributions from poorer participant beneficiaries; introducing cost recovery in flood protection investments; installing a consultative process for people affected by the project and carried throughout implementation; and integrating water resource management (planning and implementing needs) both vertically (working with administrative service providers and beneficiaries) and horizontally (cross sector cooperation and coordination among providers across administrative units).

Based on these lessons, start-up problems were averted by addressing the skills gaps in all five implementing entities. A participatory approach was used to address the needs of the poor and other vulnerable groups who would benefit from flood protection in the urban and rural areas of the project. The approach ensured farmer engagement in being responsible for the O&M of small works while the provincial, municipal, and country-level water resources agencies were responsible for the larger works on rivers, water courses, and drainage channels (ICR, paragraph 25). The institutional arrangement called for effective coordination at various levels of government including the creation of the Farmer Drainage and Irrigation Associations to be responsible for the physical flood protection works in their coverage area. Water pricing provided incentives for water saving, ensured cost recovery, and allocated efficiently water among farmers (ICR, paragraph 26).

Quality-at-Entry Rating
Satisfactory

b. Quality of supervision

The Bank focused on the development impact of the project evidenced by, on average, their twice a year supervision missions and field visits to ensure compliance and quality control. The multi-disciplinary team provided continuous support on fiduciary and safeguard issues .For example, the ICR notes that the Bank team advised counterparts on the implementation of the Resettlement Action Program and satisfactory compliance with safeguards and fiduciary arrangements. Candor in rating performance was evident in the timely response to implementation challenges. For example, just-in-time training in procurement and project management were deployed when progress reports and field visits identified the need. More experienced project management offices (PMOs) were encouraged to share with less experienced PMOs their implementation experience (ICR, paragraph 31). In addition, the Government, in its comments on the draft ICR (Annex 7, paragraph 1) appreciated the innovations in management and institutional reforms introduced under the project such as O&M planning advice and compliance with resettlement programs.
A 2014 Mid Term Review (MTR) concluded that:

- some priority activities were implemented using domestic resources
- rapid urbanization required changes in some project sites (local flood control standards were upgraded and expanded)
- depreciation of the US dollar against RMB required an increase in Government counterpart funds

The MTR recommended project restructuring to accommodate loan savings. The project was restructured twice (in December 2015 and June 2016), and in both cases (a) loan proceeds were reallocated between expenditure categories because savings were generated by using local resources in some project components, and by effective competitive bidding; (b) disbursement ratios of certain categories were revised; and (c) revised disbursement ratios were applied retroactive to November 2012 (15 months after the first disbursement). The team ensured that the project closed on time and fully disbursed.
Transition or post-project arrangements included mitigating measures to address sustainability risks. Water pricing incentives were instituted to ensure cost recovery to finance O&M needs for which FDIAs were responsible. Community awareness programs enhanced beneficiary ownership of the projects. Local governments budgeted for regular O&M. Agreements were reached with the Government on continuing to support the autonomous FDIAs. Other Bank-financed projects drew lessons from good practices of this project including those funded by other multilateral banks, such as the Asian Development Bank (ICR, Annex 10, paragraphs 10-14).

Quality of Supervision Rating

Highly Satisfactory

Overall Bank Performance Rating

Satisfactory

9. Assessment of Borrower Performance

a. Government Performance

The Government showed a strong commitment to the project by initiating preliminary studies, including

environmental studies even prior to project preparation. The draft feasibility study and Environmental Impact Assessment were prepared even prior to the Bank's first mission. Preliminary designs of on-farm structures and costs estimates for the four pilot FDIAs were prepared before appraisal. These actions signified a commitment to be ready to implement the project. The Government mobilized counterpart contributions (US$ 414 million against a US$ 200 million loan) although lack of counterpart funds for one of the four provinces and at the city and county level for all provinces (ICR, paragraph 31) were noted to have slowed implementation a year after loan effectiveness. In addition, more counterpart funds were needed for some activities in the period 2010-2014 when the US$ experienced a depreciation against the RMB (ICR, footnote 10). Domestic review and government approval of the MTR took 11 months which delayed project restructuring. However, the combination of cost savings from competitive bidding and some priority project activities implemented using domestic resources resulted in project completion by the original closing date and the loan being fully disbursed (ICR, paragraph 33).

Beneficiary and stakeholder consultations were conducted during project preparation and their results were evidenced by the support achieved by the FDIAs in instituting cost recovery in their water pricing and budgeting for O&M obligations under the project. There were no issues surrounding fiduciary obligations or safeguards compliance. The Government established fully staffed central, provincial, city and county-level project management institutions and as well as project coordination groups. Transition arrangement for regular operation of completed projects were in place, particularly in the O&M needs of the irrigation and drainage projects. There was evidence that good practices and innovations introduced under the project were incorporated into similar projects (ICR, Annex 10).

Government Performance Rating

Satisfactory

b. Implementing Agency Performance

There were five implementing agencies - the Central Project Management Office (CPMO) of the Huai River Basin Commission (HRBC), and the Project Management Offices (PMOs) of the Provincial Governments of Anhui, Henan, Jiangsu, and Shandong. All agencies worked toward achieving the PDOs. The CPMO was the lead and with prior experience implementing World Bank funded projects, guided the other PMOs adequately to ensure compliance with fiduciary and safeguard obligations. This is evidenced by the CPMO facilitating the sharing of implementation experiences between the experienced PMOs with the less experienced ones (ICR, paragraph 31). In addition, frequent training of all PMO officials and establishment of dedicated units for M&E, resettlement monitoring, and immigration supervision facilitated project implementation, leading to full loan disbursement and completing the project on time. The CPMO also established and managed the Disaster Assessment and Support system (ICR, paragraph 83).

The ICR rated the performance of the Anhui and Jiangsu PMOs as highly satisfactory and those of Henan and Shandong PMOs satisfactory (ICR, paragraphs 84 and 86). This is due to the early implementation challenges associated with raising counterpart funds in Henan and Shandong, and additionally, in the case of Shandong, inadequate institutional capacity. These challenges were addressed with frequent and intensive training and learning from the more experienced PMOs. All PMOs contributed to meeting and in some cases, exceeding targets, fully disbursing the loan and on-time project completion. In its comments

on the ICR, the Government suggested mainstreaming lessons learned and good practices particularly in the area of fiduciary obligations for the benefit of other similar projects (ICR, Annex 7, paragraph 10).

Beneficiary consultations were carried out early in the project preparation. Community participation in design helped identify locations that would most benefit both local activities and population (ICR, paragraphs 24 and 65). Farmer consultations raised awareness and FDIA promoted participatory management resulting in greater ownership, accountability, and transparency (ICR, paragraphs 55- 56). Promoting an autonomous and internally democratic FDIA increased farmers' commitment to pay water charges that bode well for a sustainable revenue stream for regular O&M needs of FDIA-supported irrigation and drainage structures. A Beneficiary Satisfaction Survey was conducted toward project close, which confirmed high satisfaction (98%) with the project. There were no shortcomings noted in complying with safeguards and fiduciary obligations, nor in implementing the M&E system. An MIS system was started during project preparation and its use was cited as instrumental in meeting the data needs of the MTR and ICR. Procurement and implementation issues were addressed early and often as evidenced by just-in-time and intensive training delivered by the Bank team, the cost savings realized in efficient procurement, in fully disbursing the loan and in completing the project on time.

Implementing Agency Performance Rating
Satisfactory

Overall Borrower Performance Rating
Satisfactory

10. M&E Design, Implementation, & Utilization

a. M&E Design
A project specific, state-of-the-art web-based M&E (PROMIS) was designed to provide consistent data, support near real-time project management and implementation by integrating information from contract management, disbursement, financial management, as well as safeguards compliance and implementation. The results framework included five PDO level indicators to measure achievement of the PDO. There were 13 intermediate outcome indicators to track progress. Two intermediate outcome indicators tracked investments rather than physical achievements:

- Intermediate Indicator 7 - Percent of investment in disaster assessment and decision support system
- Intermediate indicator 8 - Percent of investment in hydraulic model

Intermediate indicator 9 could not be reported because there was no disaster during project implementation.

b. M&E Implementation
The CPMO, based in the Huai River Basin Commission was responsible for the overall M&E implementation in coordination with the provincial PMOs. Every six months, quality progress reports were submitted to the

Bank.

c. M&E Utilization

The M&E system installed helped prepare the Mid Term Review (MTR) report, provided data to justify project restructuring, and was widely used to assess outcomes and impact on beneficiaries included in the ICR (ICR, paragraph 36). Shandong Province found the M&E system useful to improve work efficiency and project management and plans to use the system for its other projects.

M&E Quality Rating

Substantial

11. Other Issues

a. Safeguards

The project was noted as a Category A and triggered five safeguards:

- **Environmental Assessment** ((OP/BP 4.01). The World Bank confirmed satisfactory compliance (ICR, paragraph 38). All five implementing entities prepared Environmental Management Plans. Environmental provisions were included in all construction contracts. Mitigation measures in the EMPs were reported as satisfactorily implemented.
- **Natural Habitat** (OP/BP 4.04). There were 11 natural habitats in the vicinity of the project area and seven were critically located or had hydrological links with the project. Specific actions to mitigate impact followed the Environmental Management Plan and were satisfactorily implemented indicating compliance.
- **Physical Cultural Resources** (OP/BP 4.11). Ten cultural sites were discovered in Jiangsu Province and triggered chance find procedures involving relevant institutions such as the Jiangsu Provincial Cultural Resources Bureau and the Nanjing Museum. The sites have been preserved. OP 4.11 was rigorously followed.
- **Involuntary Resettlement** (OP/BP 4.12). The project developed and implemented a full-fledged resettlement action plan for each subproject in compliance with the World Bank's policy. Optimization in project design, reduced the number of people for whom resettlement was required from 7,044 to 4,884. The ICR notes full compliance with OP/BP 4.12 (ICR, paragraph 39).
- **Safety of Dams** (OP/BP 4.37). Nineteen dams were located in the project area, 17 were higher than 15 meters. Independent Dam Safety Panels were created and engaged dam O&M experts. Safety reports were undertaken, promptly submitted and remedial measures implemented. The project complied with this safeguard.

b. Fiduciary Compliance

Procurement: A Procurement Plan covering the initial 18 months of the project was prepared before implementation. Updated procurement plans were regularly submitted to reflect implementation needs and capacity improvements. Procurement strictly followed World Bank procurement guidelines (ICR, paragraph 44). There were no misprocurements noted or integrity, corruption, or complaint cases reported.
Financial Management: The ICR reports that the project complied with World Bank financial management policies (ICR, paragraph 43). All accounting and financial reports were regularly submitted and were deemed satisfactory. Audit reports were reported as unqualified. The project management offices of all the implementing entities shared experiences to ensure report consistency.

c. Unintended impacts (Positive or Negative)

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d. Other

Prehistoric sites in Jiangsu were discovered during implementation. The site was considered "one of the ten greatest archaeological discoveries in China." (ICR, paragraph 67). The conservation of the site was undertaken by the Jiangsu PMO guided by the provisions of the Environmental Impact Assessment which outlined "chance find" procedures. Clauses detailing such "chance find" procedures were included in all construction contracts and included the involvement of relevant institutions. Compliance with the safeguards has preserved the site, including the commitment from various levels of government and collaboration of local communities (ICR, paragraphs 40 and 60).

12. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Satisfactory	Satisfactory	---
Risk to Development Outcome	Modest	Modest	---
Bank Performance	Satisfactory	Satisfactory	---
Borrower Performance	Satisfactory	Satisfactory	---
Quality of ICR		Substantial	---

Note
When insufficient information is provided by the Bank for IEG to arrive at a clear rating, IEG will downgrade the relevant ratings as warranted beginning July 1, 2006.
The "Reason for Disagreement/Comments" column could cross-reference other sections of the ICR Review, as appropriate.

13. Lessons

The ICR points out five lessons (ICR, paragraphs 89-93) condensed below:

1. Identifying skills gaps during project preparation and targeting capacity building efforts to acquire appropriate skill sets prior to project approval strengthen project implementation. This approach may include customizing a Management Information System (MIS) that uses near real-time monitoring to help in day to day monitoring and critical follow up to overcome obstacles. In addition, an independent agency may be tasked to strictly monitor safeguards compliance and free PMOs to focus on core project management and project coordination needs.
2. Community participation helps build stronger ownership and is crucial to optimizing project impacts by helping to target appropriate project sites. For example, consulted famers showed increased commitment to pay water charges that generated revenues for regular O&M. In another case, participants helped locate bridges that would benefit children from poorer communities, which improved their access to schools.
3. Delegating O&M to a self-selected, self-managed association can help sustain infrastructure investments. For example, Farmer Drainage and Irrigation Associations managed specific pumping stations (based on hydraulic, not administrative boundaries), determined their own water pricing model, collected water fees, and dedicated O&M resources from these fees and charges with continuous local government guidance, training, and technology support.

14. Assessment Recommended?

No

15. Comments on Quality of ICR

The ICR is thorough, concise, results-oriented and follows OPCS guidelines. Lessons learned from the operations are based on a rich quality of evidence. For example, there were frequent references to training as a response to implementation challenges, be they institutional in nature (lack of experience) or financial (lack of counterpart funds). Cross references were helpful in supporting arguments regarding the adequacy of corrective measures undertaken. A separate annex (Annex 10) clearly outlines the mainstreaming of lessons learned from the project. There was adequate analysis. Annex 3 for example, provided clear justification of the methods and assumptions used in reaching the economic, financial, and fiscal impacts of the project.

There was little discussion of the implementation challenges brought about by the lack of counterpart funds during the early part of implementation which would have reflected negatively on the readiness of two provinces, in particular, to implement the project. There is evidence, however, that all concerned parties, pulled together to ensure that the project completed on time and that the loan was fully disbursed and targets exceeded.

The establishment of an archaeological park (ICR, paragraph 60) in response to relics discovered during project implementation and the incorporation of "chance find" measures in contracts is noteworthy.

a. Quality of ICR Rating
Substantial