



1. Project Data

Project ID P122770	Project Name IN: UP WSRP II	
Country India	Practice Area(Lead) Water	
L/C/TF Number(s) IDA-52980	Closing Date (Original) 31-Oct-2020	Total Project Cost (USD) 251,484,423.07
Bank Approval Date 28-Aug-2013	Closing Date (Actual) 30-Jun-2021	
	IBRD/IDA (USD)	Grants (USD)
Original Commitment	360,000,000.00	0.00
Revised Commitment	274,819,303.94	0.00
Actual	251,484,423.07	0.00

Prepared by Kishore Laxmikant Nadkarni	Reviewed by Dileep M. Wagle	ICR Review Coordinator Ramachandra Jammi	Group IEGSD (Unit 4)
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2. Project Objectives and Components

a. Objectives

The project development objective (PDO) was to strengthen the institutional and policy framework for integrated water resources management in the entire State; and to increase agricultural and water productivity by supporting farmers in targeted irrigation areas. (Financing Agreement Schedule 1 dated October 24,2013 and Project Appraisal Document (Para. 17). The State in question was Uttar Pradesh in India.

For the ICRR, the original PDOs are parsed as follows:



Objective 1: To strengthen the institutional and policy framework for integrated water resources management in the state of Uttar Pradesh.

Objective 2: To increase agricultural and water productivity by supporting farmers in targeted irrigation areas in the state of Uttar Pradesh.

The PDOs remained unchanged during implementation. However, targets for some PDO indicators and Intermediate Results Indicators (IRIs) were scaled down during the project's restructuring in 2019 (discussed below in Section 2 under Restructurings). This resulted in a reduction in the ambition of the Project. Consequently, a split evaluation is carried out in the ICRR.

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

Yes

Did the Board approve the revised objectives/key associated outcome targets?

Yes

Date of Board Approval

10-May-2019

c. Will a split evaluation be undertaken?

Yes

d. Components

(Reference PAD paras. 21 to 25 and ICR paras. 23 to 27).

The project components at appraisal are summarized below. The components were not revised during implementation.

Component A: Strengthening of State-Level Water Institutions and Inter-Sector Coordination:
(estimated cost at appraisal US\$15 million; actual cost at completion US\$12.28 million).

This component was to provide support to State institutions responsible for overall integrated water resources management (IWRM) and implementation of the State Water Policy (SWP). Activities included strengthening of the following state-level institutions: (i) WaMReC (Water Management and Regulatory Commission); (ii) SWaRA (State Water Resources Agency) and its Data Analysis Center (DAC); and (iii) WALMI (training institute for irrigation department engineers). The component included the following subcomponents:

- Subcomponent A1: Operationalizing the State Water Regulatory Commission.
- Subcomponent A2: Strengthening the Knowledge Base and Analytical Capacity for Integrated Water Resources Management.
- Subcomponent A3: Strengthening the Water and Land Management Institute.



Component B: Modernization and Rehabilitation of Irrigation and Drainage System: (estimated cost at appraisal US\$326 million; actual cost at completion US\$300.74 million).

This component was to cover major infrastructure and civil works planned under the Project to address the low efficiency and poor condition of the canal and drainage infrastructure. The component consisted of the following subcomponents:

- Subcomponent B1: Expansion of Irrigation and Drainage Investments.
- Subcomponent B2: Modernization of Regulation System and Service Delivery in Phase I areas.
- Subcomponent B3: Groundwater Management Activities.

Component C: Consolidation and Enhancement of Irrigation Institutional Reforms: (estimated cost at appraisal US\$42 million; actual cost at completion US\$15.97 million).

This component was to provide support for enhancing the efficiency of UPID (Uttar Pradesh Irrigation Department) as well as strengthening a participatory irrigation management (PIM) approach both within the Department and the communities served by it. The component had the following subcomponents:

- Subcomponent C1: UPID Modernization and Capacity Building.
- Subcomponent C2: Strengthening of Water User Associations (WUAs) and Implementing Participatory Irrigation Management (PIM).

Component D: Enhancing Agriculture Productivity and On-Farm Water Management: (estimated cost at appraisal US\$32 million; actual cost at completion US\$11.50 million).

This component was to provide support to improve overall agricultural productivity and water-use efficiency in Phase I and Phase II outlet command areas. Improvements in irrigation water availability and timely support to WUAs were to be integrated with improved agricultural production and on-farm water management practices.

Component E: Feasibility Studies and Preparation Activities for the Next Phase: (estimated cost at appraisal US\$2 million; actual cost at completion US\$0 million).

This component was to support the preparation of feasibility studies and preparation activities for the next phase (Phase III), including preparation of detailed surveys and designs for new areas identified by the Government of Uttar Pradesh (GoUP), making use of design principles and lessons learned from Phase II.

Component F: Project Coordination and Monitoring: (estimated cost at appraisal US\$23 million; actual cost at completion US\$18.77 million).

This component was to consist of two Subcomponents as follows:

- Subcomponent F1: Support to the Project Activities Coordination Team (PACT) for (i) management of critical support consultancies; (ii) ensuring synergy and coordination among activities across relevant departments and implementing agencies; (iii) preparing consolidated reports; and (iv) facilitating training and study tours.



- Subcomponent F2: Support to the Uttar Pradesh Remote Sensing Applications Center (RSAC) for monitoring of crop Performance by using remote sensing imagery.

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

Project Cost: At appraisal, the project cost was estimated at US\$515.00 million. It was revised to US\$392.8 million at project restructuring. The actual cost at completion was estimated at US\$359.3 million. (ICR Data Sheet). The reduction of about US\$155 million in the project cost was due to (i) cancellation of US\$90 million that had originally been included as an unallocated amount intended to cover any additional investments that may be needed; it was later determined that this amount would not be needed; and (ii) reduction in the US dollar equivalent of project expenditures that were incurred in the local currency (INR) as a result of exchange rate changes during implementation.

Financing: At appraisal, the Project was to be financed through an IDA grant of US\$360 million. The allocation was reduced to US\$274.8 million at project restructuring. The final amount disbursed was US\$251.5 million. (ICR Data Sheet).

Recipient Contribution: At appraisal, the Recipient's contribution was planned at US\$155 million. It was reduced to US\$117.9 million at project restructuring. At completion, the actual contribution was US\$107.8 million. (ICR Data Sheet).

Dates: The Project was approved on August 28, 2013 and became effective on December 10, 2013. The planned closing date was October 31, 2020. The actual closing date was June 30, 2021.

Mid-Term Review: A Mid-Term Review (MTR) was carried out in April 2017.

Restructurings: The Project underwent seven Level 2 restructurings. The original PDOs remained unchanged during project implementation. However, targets for some PDO indicators and Intermediate Results Indicators (IRIs) were scaled down during the first restructuring in April 2019. No changes were made to the project components. Reallocations were made between categories depending upon need and prospects for progress.

First Restructuring (April 2019 - disbursed amount US\$138.6 million, 41% of the project cost): The restructuring followed a delay of about two years in project implementation due to shortfalls in counterpart financing, capacity-related weaknesses in the implementing agencies, and slow progress in civil works (Restructuring Paper, April 2019). It was assessed that the original targets of some PDO indicators and Intermediate Results Indicators (IRIs) would not be achievable by the planned closing date of October 31, 2020. Targets for some PDO indicators were significantly reduced as follows:

- PDO1 (river basin assessments and plans completed): number reduced from 8 to 5.
- PDO2 (operational water user associations created and/or strengthened: number reduced from 900 to 500.
- PDO4 (percentage increase of agricultural output in the project areas: reduced from 68 percent to 50 percent.



- PDO5: (percentage increase in system wide water use productivity in project area): was dropped. The ICR (Annex 7, para. 4) indicates that this was because the two PDO-level indicators ("increase in crop yields in the project areas" and "percentage increase of the agricultural output in the project areas") were found to be sufficient for reporting outcomes of the related PDO "to increase agricultural productivity and water productivity by supporting farmers in target irrigation areas"). With this change, there was no longer a PDO-level indicator specifically measuring increase in water productivity. However, the ICR indicates (Annex 6, para. 51) that water productivity (measured in agricultural output per m³ of water) was tracked and showed a doubling between 2015-2016 and 2020-2021.

Second to Seventh restructurings (between September 2019 to February 2021): The changes made included (i) cancellations in financing and (ii) reallocations between categories. Under the fifth restructuring (October 2020), the closing date was extended by 8 months (from October 31, 2020 to June 30, 2021) to allow for completion of project activities impacted by the COVID pandemic.

3. Relevance of Objectives

Rationale

(Reference PAD paras. 1 to 13 and ICR paras. 1 to 15).

Country/State Context: Uttar Pradesh (UP) is India's fourth largest and most populous state with a predominantly rural economy. At appraisal in 2013, agriculture accounted for a quarter of the State's gross domestic product and 60 percent of its employment. UP has the largest irrigated area among all the Indian states. Irrigated agriculture was among the largest users of water in the State. With increasing development and increasing demand from the agricultural sector and other water users, significant water security and availability challenges were emerging, necessitating a more integrated approach towards water resources planning, management, and use. (ICR paras. 1 and 2).

Sector and Institutional Context: Water resource management: Despite the State's large network of perennial rivers and alluvial aquifers, availability of water resources was being affected by significant temporal and spatial variations. Substantial parts of the State were either drought-prone or floods-prone. Such variability was expected to be further exacerbated by the impacts of climate change. Adoption of an integrated water resources management (IWRM) approach in the State was constrained by the fragmented nature of the water sector. Institutional weaknesses, including a weak legal, regulatory, and administrative framework resulted in a lack of interdepartmental coordination and decision-making necessary to deliver IWRM at the basin and State level. (ICR paras. 3 and 4). Irrigation and Agriculture: At appraisal, the State's irrigation and drainage infrastructure was deemed to be the key constraint to increasing agricultural productivity. UP's surface waters were inefficiently utilized for irrigation primarily due to dilapidated canal structures, leading to poor water service delivery to farmers. Thus, rehabilitation and modernization of the irrigation and drainage (I&D) systems became a key requirement in ensuring more reliable and equitable I&D service delivery to farmers. Making infrastructural improvements in the I&D systems, particularly at the secondary and tertiary levels, required greater involvement of water users in their management, operation, and maintenance. (ICR paras. 5 to 7). Recognizing that a coordinated approach was essential in regard to strengthening UP's water sector institutions and improving its irrigated agriculture, the State Government decided to adopt a multi-faceted long-term program covering a 15 to 20 years span. The World Bank



supported the program through Phase 1 of the UP - Water Sector Restructuring Project (UPWSRP) that included rehabilitation and modernization of I&D systems in some areas, and pilot activities, including irrigation, and crop production improvement demonstrations for farmers. An important achievement under Phase 1 was the establishment of key water resources management (WRM) institutions including the Uttar Pradesh Water Regulatory Commission (UPWaMReC), an independent water regulatory authority, and the State Water Resources Agency (SWaRA). Other achievements under Phase 1 included establishment and/or strengthening of Water User Associations (WUAs) at the secondary and tertiary levels in multiple areas; and introduction of a Management Information System (MIS) for the UP - Irrigation Department (UPID). (ICR paras. 13 to 15).

Alignment with national priorities: The Project Development Objectives (PDOs) were aligned, and remain aligned, with the national priorities at the time of appraisal as well as the priorities at the present time. The PDOs were consistent with the strategic objectives of raising agricultural productivity and strengthening irrigation water management articulated in the national Twelfth Five-Year Plan (2012 to 2017). The PDOs remain consistent with the priorities in the State Water Policy (SWP) of 2020 which states that the twin objectives of agricultural growth and low water demand are to be achieved through increased economic and irrigation water productivity and a concurrent reduction in water use by the agricultural sector. (ICR paras. 17 and 38).

Alignment with Country Partnership Strategy/Framework: The PDOs were aligned, and remain aligned, with the World Bank Group (WBG) Country Partnership Strategy (CPS) for FY 2013 to 2017 in effect at the time of appraisal, and with the Country Partnership Framework (CPF) for FY 2018 to 2022 in effect at project closing. The PDOs are consistent with Focus Area 1 of the CPF which promotes resource-efficient growth through the enabling enhanced agricultural productivity and improved efficiency in the use of water and land resources to attain modern, climate-change resilient production systems. (ICR para. 39).

Prior Bank Experience: The World Bank has been involved in the agriculture and water resources sector in India for decades. In the case of Uttar Pradesh, the current UPWSRP Phase II represents the second phase of the project following completion of Phase 1 (in 2011). Phase I represented an initiation of an integrated water resource management (IWRM) approach including I&D improvement investments in some areas; pilot projects for demonstrating improved irrigation techniques and water conservation; and institutional strengthening aimed at improving cross-sectoral coordination. The Phase II project builds on the experience gained under Phase 1 with the objective of scaling-up and deepening the gains made under Phase I. (ICR paras. 12 to 15).

Relevance of Objectives: Given the context described above, the PDOs were consistent, and remain consistent, with the priorities in the national programs and the WBG Country Assistance Strategy/Country Partnership Framework. The PDOs were pitched at the appropriate level taking into account the development needs and the State's capacity for implementation.

Rating

High



4. Achievement of Objectives (Efficacy)

OBJECTIVE 1

Objective

To strengthen the institutional and policy framework for integrated water resource management in the state of Uttar Pradesh.

Rationale

Theory of Change: The ICR provides a diagrammatic presentation of the theory of change (TOC) and the results chain from activities to outcomes. The underlying rationale was that, to increase water security and the adequacy of water resources in the State, it was necessary to adopt an integrated cross-sectoral approach, including capacity-building in key water resources sector institutions, enhancing inter-sectoral coordination, and improving the efficiency of water use in irrigated agricultural production, which was the largest consumer of water. The Project would provide financing for technical assistance and investments to enable the State to achieve the agreed objectives.

In regard to Objective 1, the Project would provide inputs through technical assistance and investment financing. These inputs would directly lead to outputs including development and operationalization of essential systems including, Basin Assessment and Planning System; Flood Management and Information System; Installation of Automatic Rain Gauges; and Real Time Data Acquisition System. The intermediate results would be improved flood forecasting capacity and training of engineers in modern participatory approaches. The outcome would be strengthening of the institutional and policy framework for integrated water resources management for the entire State. The outcome would contribute to the longer-term outcome of ensuring adequacy of water availability in the State.

The causal links and results chain in the TOC in regard to Objective 1 were clear. To measure the achievement of the PDOs, two PDO indicators and four Intermediate Results Indicators (IRIs) were used. The adopted PDO indicators and IRIs were generally relevant, measurable, and appropriate for assessing achievement of Objective 1.

Key assumptions were that the institutions concerned would (i) satisfactorily internalize and operate the improved systems and procedures and (ii) ensure inter-institutional cooperation as required.

Outputs and Intermediate Results Indicators: (as reported in the ICR Annex 1 - Results Framework and paras. 40 to 47).

Outputs

- 8 river basin assessments completed together with accompanying Action Plans.
- A Basin Assessment and Planning System developed consisting of (i) a knowledge base and (ii) analytical tools, thereby enabling the assessment and analysis of current and future water availability as well as water consumption and demand.
- A Flood Management Information System (FMIS), providing a flood forecasting and early warning system, was developed and operationalized.



- A groundwater management plan was prepared.
- 300 groundwater monitoring stations were constructed.
- A Groundwater Information System (GWIS) for the State was established.
- 1,338 Water User Associations (WUAs) were created of which 1,315 made functional. A total of 183,012 water users were inducted in the outlet-level WUAs as members.

Intermediate Results Indicators

- Improved flood forecasting system established for the Rapti Basin (baseline 0; target 1; actual 1; target achieved).
- Engineers trained in modern participatory approaches at WALMI (baseline 0; target 1,030; actual 2,222; target overachieved).

PDO Indicators: (as reported in the ICR Annex 1 - Results Framework and pars. 40 to 47).

PDOI-1: River basin assessments and plans completed: (baseline 0; target 8; actual 8; target achieved).

PDOI-2: Operational water user associations created and/or strengthened: (baseline 0; target 900; actual 1,338; target overachieved).

Outcomes: In regard to Objective 1, the targeted outputs and IRIs were achieved. Achievement of Objective 1 was to be assessed based on two PDO indicators: (i) river basin assessments and plans completed and (ii) operational WUAs created or strengthened. The targets for both indicators were achieved as indicated above. Overall, the achievements, including development and operationalization of essential analytical and monitoring systems, preparation of river basin assessments and plans, training of engineers in the institutions in modern participatory approaches, and expansion/strengthening of WUAs, contributed significantly to strengthening the institutional and policy framework for IWRM in the State. The results can reasonably be attributed to the interventions under the Project. Based thereon, Objective 1 is assessed to have been fully achieved.

Rating

High

OBJECTIVE 1 REVISION 1

Revised Objective

To strengthen the institutional and policy framework for integrated water resources management in the state of Uttar Pradesh.

Revised Rationale

The PDOs, including Objective 1, were not revised during project implementation. However, during the project restructuring in 2019, targets in regard to some PDO indicators and IRIs were scaled down significantly, resulting in a reduction in the ambition of the Project (discussed earlier in Section 2 under Restructurings). Therefore, a split evaluation was undertaken in the ICRR.



The TOC and results chain, presented earlier under Objective 1, remained essentially unchanged for Revised Objective 1.

Outputs and Intermediate Results Indicators: (as reported in the ICR Annex 1 - Results Framework and paras. 40 to 47).

Outputs: The outputs were essentially the same as reported above under Objective 1.

Intermediate Results Indicators

- Improved flood forecasting system established for the Rapti Basin (baseline 0; target 1; actual 1; target achieved).
- Engineers trained in modern participatory approaches at WALMI (baseline 0; target 1,030; actual 2,222; target overachieved).

PDO Indicators: (as reported in the ICR Annex 1 - Results Framework and paras. 40 to 47).

- River basin assessments and plans completed: (baseline 0; original target 8; revised target 5; actual 8; revised target overachieved).
- Operational water user associations created and/or strengthened: (baseline 0; target 900; actual 1,338; target overachieved).

Outcomes: In regard to Revised Objective 1, the targeted outputs and IRIs were achieved. Achievement of Revised Objective 1 was to be assessed based on two PDO indicators: (i) river basin assessments and plans completed and (ii) operational WUAs created or strengthened. The revised targets for both indicators were overachieved as indicated above. Overall, the achievements, including development and operationalization of essential analytical and monitoring systems, preparation of river basin assessments and plans, training of engineers in the institutions in modern participatory approaches, and expansion/strengthening of WUAs, contributed significantly to strengthening the institutional and policy framework for IWRM in the State. The results can reasonably be attributed to the interventions under the Project. Based thereon, Revised Objective 1 is assessed to be fully achieved.

Revised Rating

High

OBJECTIVE 2

Objective

To increase agricultural and water productivity by supporting farmers in targeted irrigations areas in the state of Uttar Pradesh.

Rationale

Theory of Change: The rationale underlying the overall TOC was presented earlier under Objective 1.



In regard to Objective 2, the TOC was that, to achieve the targeted improvements in agricultural and water productivity, it was necessary to adopt a coordinated approach including: (i) modernization and rehabilitation of irrigation and drainage (I&D) systems; (ii) consolidation and enhancement of institutional reforms; and (iii) enhancement of agricultural productivity and on-farm management. The Project would provide inputs through financing of technical assistance and infrastructure investments. These inputs would result in outputs including: (i) establishment and operationalization of systems for ground water management and monitoring; (ii) modernized and rehabilitated I&D systems put in place; (iii) creation and/or strengthening of Water User Associations, specially at the secondary and tertiary levels; (iv) institutional staff trained in use of the enhanced technology; and (v) farmers, facilitators, and agency staff trained in improved irrigation techniques and water management. The intermediate results would include (i) improved systems for groundwater management; (ii) increase in area provided by improved I&D services; (iii) increase in number of water users provided with improved I&D services; (iv) reduction in area with water-logging problems; (v) increase in irrigation intensity; and (vi) establishment and operationalization of a performance monitoring (PIM) system in UPID. The resulting outcome would be an increase in agricultural and water productivity in the targeted irrigation areas. The longer-term outcome would be increased economic benefits to the farmers and other water users in the targeted areas.

Outputs and Intermediate Indicators: (as reported in the ICR Annex 1 - Results Framework and paras. 49 to 51).

Outputs

- 443,763 hectares (ha) of area were provided with improved I&D services.
- 545,828 water users were provided with improved I&D services (of which 29,753 female)
- 66.15% increase in agricultural crop output was observed in the project areas.
- 2,222 engineers were trained in modern participatory approaches (including Performance Improvement Monitoring).
- SCADA systems were established for better monitoring of canal systems.

Intermediate Results Indicators

- Improved area provided with I&D services (baseline 0 ha; target 600,000 ha; actual 443,763 ha; target underachieved).
- Water users provided with new/improved I&D services (baseline 0; target 570,000; actual 545,828; target achieved). Female water users (baseline 0; target 29,000; actual 29,753; target achieved).
- Percentage reduction in area with water logging problems (baseline 0; target 75%; actual 76.31%; target achieved).
- Increase in irrigation intensity (baseline 59%; original target 75%; actual 87.43%; target achieved).
- Groundwater Management Plan prepared (Baseline 0; target 1; actual 1; target achieved).
- Performance Improvement Management cells established by UPID (baseline 0; target 21; actual 22; target achieved).
- Percentage of water user associations (WUAs) (minor level) with transfer of Operations & Maintenance (O&M) funds (baseline 52.60%; target 100%; actual 93%; target substantially achieved).
- Farmer water schools established (baseline 0; target 5,520; actual 4,000; target underachieved).



- Clients who have adopted improved agricultural technology promoted by the Project (baseline 0; target 71,700; actual 72,562; target achieved).

PDO Indicators: (as reported in the ICR Annex 1- Results Framework and para. 40).

PDOI-1: Increase in crop yields in project areas (tons per year - tpy).

- Rice (baseline 2.90 tpy; target 4.30 tpy; actual 4.51 tpy; target achieved).
- Wheat (baseline 2.50; target 3.80 tpy; actual 3.84 tpy; target achieved).
- Pulses (baseline 0.50; target 0.85 tpy; actual 0.86 tpy; target achieved)
- Oilseeds (baseline 0.75 tpy; target 1.00 tpy; actual 1.13 tpy; target achieved).

PDOI-2: Percentage increase of agricultural output in the project areas (baseline 0%; target 68.0%; actual 105.7%; target overachieved).

PDOI - 3: Increase in system-wide water use productivity in the project areas: (not tracked prior to the restructuring of the project; the indicator was dropped at the first restructuring).

Outcomes: Targets for most IRIs were achieved or substantially achieved. However, in regard to one significant IRI, "improved area provided with I&D services", the target was significantly underachieved. The PDO outcome was to be assessed on the basis of three PDO indicators: (i) increase in project yields in project areas; (ii) percentage increase of agricultural output in project areas; and (iii) increase in system-wide water use productivity in project areas. Targets for the first two PDO indicators were achieved at project closing although progress towards achieving these indicators had been slow prior to the project restructuring in 2019 (which resulted in scaling down of some of the targets during the restructuring). The target for the third PDO indicator was not achieved, and the indicator was dropped at the first restructuring in 2019. Based thereon, Objective 2 is assessed to have been substantially underachieved.

Rating
Modest

OBJECTIVE 2 REVISION 1

Revised Objective

To increase agricultural and water productivity by supporting farmers in targeted irrigation areas in the state of Uttar Pradesh.

Revised Rationale

The PDOs, including Objective 2, were not revised during project implementation. However, during the project restructuring in 2019, targets in regard to some PDO indicators and IRIs were scaled down significantly, resulting in a reduction in the ambition of the Project (discussed earlier in Section 2 under Restructurings). Therefore, a split evaluation was undertaken in the ICRR.



The TOC and results chain, presented earlier under Objective 2, remained essentially unchanged for Revised Objective 2.

Outputs and Intermediate Results Indicators: (as reported in the ICR Annex 1 - Results Framework and paras. 49 to 51).

Outputs: The outputs were essentially the same as reported above under Objective 2.

Intermediate Results Indicators

The IRIs under Revised Objective 2 were essentially the same as under Objective 2. However, targets for some IRIs had been scaled down during the project restructuring. At Project closing, all the revised IRI targets had been achieved or overachieved.

PDO Indicators: (as reported in the ICR Annex 1 - Results Framework and para. 40).

PDOI-1: Increase in crop yields in project areas (tons per year - tpy).

- Rice (baseline 2.90 tpy; target 4.30 tpy; actual 4.51 tpy; target achieved).
- Wheat (baseline 2.50; target 3.80 tpy; actual 3.84 tpy; target achieved).
- Pulses (baseline 0.50; target 0.85 tpy; actual 0.86 tpy; target achieved).
- Oilseeds (baseline 0.75 tpy; target 1.00 tpy; actual 1.13 tpy; target achieved).

PDOI-2: Percentage increase of agricultural output in the project areas (baseline 0%; target 68.0%; revised target 50%; actual 105.7%; target overachieved).

Outcomes: The targets, including revised targets, for the IRIs were achieved or overachieved. Following the restructuring, the PDO outcome was to be assessed on the basis of two PDO indicators: (i) increase in project yields in project areas and (ii) percentage increase of agricultural output in project areas. The revised targets for both these indicators were achieved or overachieved at project closing. Regarding measuring increase in water productivity, following the dropping of the original PDO indicator at restructuring, there was no longer a specific indicator included in the Results Framework for tracking improvement in water productivity. However, the ICR indicates (Annex 6, para. 51) that, starting 2015-2016, water use productivity was assessed for each of the three regions supported under the Project (ICR, Annex 6, Table 5.1). This indicates that, for the three regions together, water use productivity (as measured by agricultural output per m³ of water used) increased from 0.20 kg/m³ in 2015-2016 to 0.40 kg/m³ in 2020-2021. These results, taken together, indicate that, post-restructuring, Objective 2 was achieved. However, given that the water productivity indicator was not formally tracked as part of the Results Framework, the efficacy of Objective 2 Revision 1 is rated Substantial.

Revised Rating
Substantial



OVERALL EFFICACY

Rationale

The Project had two development objectives. The PDOs were not changed during implementation. However, as discussed earlier in Section 2, at a project restructuring in 2019, targets for some PDO indicators and IRIs were scaled down, leading to a reduction in the ambition of the Project. Therefore, a split evaluation was carried out in the ICRR.

As discussed earlier in Section 4, the efficacy of Objective 1 is rated High and that for Objective 2 is rated Modest. Based thereon, the overall efficacy is rated Substantial.

Overall Efficacy Rating

Substantial

OVERALL EFFICACY REVISION 1

Overall Efficacy Revision 1 Rationale

The Project had two development objectives. The PDOs were not changed during implementation. However, at a project restructuring in 2019, targets for some PDO indicators and IRIs were scaled down, leading to a reduction in the ambition of the Project. Therefore, a split evaluation was carried out in the ICRR.

As discussed earlier in Section 4, the efficacy of Objective 1 Revision 1 was rated High and that of Objective 2 Revision 1 was rated Substantial. Based thereon, the overall efficacy is rated Substantial.

Overall Efficacy Revision 1 Rating

Substantial

5. Efficiency

(Reference PAD paras.38 to 41 and Annex 7 and ICR paras.53 to 55 and Annex 4The).

Economic Efficiency

At appraisal: The economic efficiency of the Project was assessed using a cost-benefit methodology based on an incremental net benefits approach i.e. incremental costs and benefits attributable to the Project derived from a comparison of the 'with-project' and 'without-project scenarios'. Economic costs included the capital investment costs and estimated operations and maintenance (O&M) expenses. Quantifiable economic benefits were derived from: (i) expansion in irrigation services; (ii) increase in overall cropping intensity; (iii) increase in crop yields; (iv) substitution of canal water for groundwater resulting in savings in diesel fuel and electric power expenses; (v) conversion of water-logged lands into productive crop lands; and (vi) potential savings in flood damage costs due to an improved Flood Management Information System (FMIS) and flood forecasting tools. The economic viability indicators adopted were the Economic Internal Rate of Return (EIRR) and Economic Net



Present Value (ENPV) at a discount rate of 10 percent. Based thereon, the EIRR and ENPV were estimated at 20.4 percent and INR 17.2 billion respectively. (ICR Annex 4 para. 33).

Post-Completion: The ICR reports (Annex 4, para. 4) that the post-completion analysis was carried out using generally the same methodology as at appraisal but updated for the actual values and results observed during implementation. On this basis, the post-completion estimates were: EIRR of 21.4 percent (appraisal 20.4 percent) and ENPV of INR 8.0 billion appraisal INR 17.2 billion). (ICR Annex 4, para. 33). While the post-completion EIRR is higher than at appraisal, the ENPV is substantially lower. Reasons for the lower achievement are not clearly explained in the ICR. (ICR para. 53 and Annex 4 para. 33).

Implementation Efficiency

Project Cost: The Project was carried out within the cost estimated at appraisal. At completion, the project cost was US\$359.3 million, substantially lower than the US\$515.0 million estimated at appraisal. The reduction in the total project cost was due to (i) cancellation of an unallocated amount of US\$90 million that had originally been included in case additional investments were needed during implementation; it was later deemed that the amount was not needed; and (ii) reduction in the US dollar equivalent of project expenditures incurred in the local currency (INR) due to the significant depreciation of about 27 percent in the INR during the implementation period (from INR 59.41 to INR 75.00 per US\$1).

Project Duration: The implementation period estimated at appraisal was 82.5 months (nearly 7 years). The actual implementation period was 90.5 months (7.5 years). The closing date was extended once by 8 months to allow for completion of Project activities, including delays caused by the COVID pandemic.

Rating of the Project's Efficiency: Based on the foregoing, the Project's economic efficiency and implementation efficiency are both rated Substantial, leading to an overall efficiency rating of Substantial.

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	✓	20.40	0 <input type="checkbox"/> Not Applicable
ICR Estimate	✓	21.40	0 <input type="checkbox"/> Not Applicable

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



6. Outcome

As explained in Section 4, a split evaluation was carried out in the ICRR. The Project's pre-restructuring and post-restructuring outcomes were assessed on the basis of Relevance of Objectives, Efficacy, and Efficiency. The results are presented in the following table.

Project Outcome Rating

	Before Restructuring	After Restructuring
Relevance of PDOs	High	High
Efficacy (Achievement of PDOs)		
PDO 1	High	High
PDO 2	Modest	Substantial
Overall Efficacy	Substantial	Substantial
Efficiency	Substantial	Substantial
Outcome Ratings	Satisfactory	Satisfactory
Numerical Value of Outcome Ratings	5	5
Disbursement (US\$ million)	138.59	112.89
Share of Disbursement	55%	45%
Weight of Disbursement	0.55	0.45
Weighted Value	2.75	2.25
Overall Outcome Rating	$2.75 + 2.25 = 5.00$	
Satisfactory		

a. Outcome Rating

Satisfactory

7. Risk to Development Outcome

Technical Risks: These are rated Moderate. While the institutional agencies generally have the institutional capacity and experience to operate and maintain the physical infrastructure and enhanced technology-based systems for information collection, monitoring and management, technical assistance support may be needed from time to time. Timely and adequate availability will depend upon the State Government's responsiveness to the emerging needs.

Beneficiary Engagement Risks: These are rated Moderate. While significant productivity gains have been made under the Project, sustainability will depend upon continued beneficiary engagement and capacity. This will require continuing involvement of the agencies in ensuring adequate incentivization of the farmers and other beneficiaries. Since water user associations (WUAs) have a significant role in ensuring agricultural



and rural productivity, including operations and maintenance (O&M) of some I&D facilities, timely and sufficient availability of funds to cover O&M expenses will be necessary for effective performance.

Institutional Risks: These are rated Moderate. The concerned institutions will need to fully internalize and deepen their efficiency in operating and maintaining the advanced water resources monitoring and management systems set up under the Project. Given the cross-sectoral nature of IWRM, maintaining and further strengthening inter-departmental coordination will be necessary for ensuring sustainability of the productivity gains.

8. Assessment of Bank Performance

a. Quality-at-Entry

(Reference ICR paras. 90 to 93).

The strategic relevance and PDOs were well aligned, and continue to be well aligned, with the priorities in the national programs and in the WBG Country Assistance Strategy/Country Partnership Framework. The project design was based on a generally sound theory of change and the Results Framework was generally adequate for the purposes of monitoring and evaluating implementation progress with the exception of the PDO indicator linked to measurement of increase in water productivity. During implementation, it was found that the indicator was difficult to measure, and it was dropped at the first restructuring. Project design of this Phase II Project benefited from the experience and lessons learned under the earlier Phase I (implemented from 2004 to 2011). Technical, financial, and economic aspects were generally well covered. Environmental and social aspects were adequately covered through preparation of the relevant Environmental and Social Management Framework (ESMF) and training of the staff in the implementing agencies. The risk assessment and proposed mitigation measures were adequate. The overall risk rating for the Project was Substantial, reflecting mainly the Stakeholder and Implementation Agency risks which were assessed as Substantial. To mitigate these risks, technical assistance and training were provided to the relevant staff at the implementing agencies including PACT and UPID. To build support for the Performance Improvement Management (PIM) agenda under the Project, particular attention was provided to establishment of sustainable WUAs along with the required training of personnel. The Project's M&E system built upon the system introduced under Phase I, introducing required changes and improvements, and was generally adequate.

Quality-at-Entry Rating

Satisfactory

b. Quality of supervision

(Reference ICR paras. 63 to 66, 94 and 95).

During project implementation, the Bank supervision team remained focused on development. The team was generally proactive in identifying emerging or anticipated issues and seeking solutions with the



counterparts. A Mid-Term Review (MTR) was carried out in April 2017. However, the first project restructuring, including a significant scaling down of some PDO indicators and IRs, took place only in April 2019, one year before the planned closing date. Procurement and contract management issues significantly delayed implementation between 2017 to 2019. In part, this was due to capacity weaknesses in the main implementing agencies (IAs) including PACT and the concerned line departments. Shortfalls in counterpart funding also affected timely implementation of some works. These procurement and contract management issues required intensive supervision from the supervision team, particularly when the Project's Implementation Progress (IP) rating was rated Moderately Unsatisfactory in 2019.

During the implementation period of 7.5 years, the Bank team carried out a total of 15 supervision missions, averaging about two per year. The missions were adequately supported by safeguards and fiduciary specialists as required. Technical specialists and consultants provided assistance and support to the implementing agencies as required, Implementation progress, issues, guidance, and action plans agreed with the counterparts were recorded in Aide-Memoires and Implementation Status Reports (ISRs). The Back-to-Office reporting was generally candid and highlighted issues for the attention of management e.g., the Implementation Progress (IP) ratings were kept at 'Moderately Unsatisfactory' from time to time to reflect delays in procurement and disbursement when they occurred.

Overall, the Bank's supervision performance contributed significantly to the Project's implementation efficiency which is rated Substantial (in Section 5 above). However, a shortcoming was that the PDO indicator related to measuring increase in water productivity was found to be difficult to measure and dropped only at the first restructuring in April 2019, six years into implementation. Thereafter, it was not substituted by another PDO-level or IR indicator formally included in the Results Framework. As a result, changes in water use productivity were not formally tracked as a part of the Results Framework.

Quality of Supervision Rating

Moderately Satisfactory

Overall Bank Performance Rating

Satisfactory

9. M&E Design, Implementation, & Utilization

a. M&E Design

(Reference ICR paras. 69 to 71).

The M&E design was based on an adequate theory of change. The Results Framework was generally sufficient to assess performance, with most indicators well aligned to the PDOs. However, the PDO-level indicator related to measuring increase in water productivity was found to be difficult to measure and had to be dropped at the first restructuring. Also, as acknowledged in the ICR (para. 70), some key terms could have been better defined for clarity including those relating to agricultural output and cropping intensity. The ICR notes that, while these terms could have been better defined, they did not adversely affect assessment of the Project's results. Overall responsibility for the Project's M&E system, including data



collection, monitoring, analysis, and results reporting was assigned to the apex body PACT which had been performing the function since Phase I.

b. M&E Implementation

(Reference ICR paras. 72 and 73).

PACT coordinated M&E activities with the other agencies involved in monitoring and reporting their respective activities under the Project. PACT was supported by an external M&E agency - the Monitoring Management Information System and Evaluation Consultancy (MMISEC) that was engaged for the duration of the Project. Among other items, the M&E system monitored (i) project performance (both physical and financial) against planned activities; (ii) institutional performance; (iii) environmental and social safeguards issues; (iv) internal learning and dissemination; (v) evaluation and assessment of impacts; and client satisfaction.

c. M&E Utilization

(Reference ICR para. 74).

The Project's M&E system was used to monitor and assess the Project's progress, outputs, outcomes, and impacts. Information from the system enabled the government authorities and the Bank to identify implementation issues that needed to be addressed and take required actions. The Project's MIS included a website that ensured a more transparent processes including procurement and governance within UPID.

Rating of M&E Quality: On balance, the M&E Quality is rated Substantial with some minor shortcomings.

M&E Quality Rating

Substantial

10. Other Issues

a. Safeguards

(Reference ICR paras. 77 to 83).

At appraisal, the Project was designated a Category B project. The Project triggered the following safeguards: Environmental Assessment (EA) - OP 4.01; Pest Management (PM) - OP 4.09; Involuntary Resettlement (IR) - OP 4.12; Safety of Dams (SD) - OP 4.37; and Projects on International Waters (PIW) - OP 7.50.

Environmental: The ICRF reports (para. 72) that compliance with environmental safeguards was sound throughout the Project. To mitigate potential environmental impacts, the Project developed the following



instruments: (i) Environmental and Social Management Framework (ESMF); (ii) project-specific Environmental and Social Assessments (ESAs) in all the Project areas; (iii) Environmental Impact Assessment (EIA) and Environment Management Plan (EMP). Potential adverse impacts included (i) disposal of silt during rehabilitation of irrigation infrastructure; (ii) construction and installation of irrigation control structures and small bridges over canals; (iii) use of agro-chemicals for increasing crop intensity; and (iv) poor construction quality and unsafe construction practices. The ICR reports that these were addressed by Quality Supervision Protocols issued by PACT. The ICR reports (para. 79) that a specific issue in 2016 related to compliance with safeguards for planned and efficient disposal of silt was satisfactorily addressed by PACT, UPID and the contractors involved.

Apart from EA (OP 4.01), the ICR does not report on the compliance under the other triggered environmental safeguards: Pest Management; Safety of Dams; and Projects on International Waters.

Social: The ICR reports that the Project's social safeguards compliance was rated Moderately Satisfactory. (ICR para. 80). The Bank's OP 4.12 on Involuntary Resettlement (IR) was triggered as a precautionary measure and a Resettlement Policy Framework (RPF) was prepared. The Project's updated ESMF also included a Vulnerable Peoples Plan, a Gender Plan, and a Grievance Redress Mechanism (GRM). During the COVID-19 pandemic, strict health measures were implemented. No fatal COVID-19 cases were recorded at any site. Towards the end of the Project, 13 cases of adverse impacts on peoples' livelihoods were registered as resulting from improper silt disposal. An Abbreviated Resettlement Action Plan (ARAP) was prepared by PACT. Following a consultation with the Bank's social safeguards team, PACT proved information on each identified case to confirm that the livelihoods of the affected people had been fully restored. The ICR confirms (para. 82) that the Project complied with the requirements of the Bank's resettlement safeguards policy under OP 4.12,

Grievance Management: The ICR reports (para. 83) that a Grievance Redress Mechanism (GRM) remained functional through the implementation period. In addition to access via on-site complaint or suggestion registers, and a toll-free helpline, a multi-lingual, automated, and web-enabled Grievance Redressal System (GRS) was set up. A total of 23 Grievances Redressal Centers (GRCs) were established in the project areas. The ICR does not report on the number and nature of grievances registered or how they were resolved.

b. Fiduciary Compliance

(Reference ICR paras. 85 to 89).

Procurement: PACT provided guidance and assistance on matters related to procurement, including compliance with the World Bank's procurement-related guidelines, to all the concerned line departments involved under the Project. Although there were several procurement and contract management issues that significantly delayed project implementation, particularly in 2018 and 2019, the ICR affirms (para. 87) that, overall, procurement compliance was adequate. At project closing, the Procurement Rating was Moderately Satisfactory (MS).

Financial Management (FM): Given the spread of the Project's implementation across multiple line departments and accounting locations, the financial management (FM) risk was rated Substantial at appraisal. Under the Phase 1 operation, implementation of the FM system was found to be weak. The ICR



reports (para. 88) that this risk was partly mitigated by using existing (in-country) financial management systems in the implementing agencies. Accounting was also performed on a cash basis (rather than accrual basis). Engagement of a local chartered accountant as an FM consultant facilitated improved coordination between PACT and the line departments. Audits included Management and Financial Audits. The ICR reports (para. 89) that PACT and the line departments regularly reviewed the audit findings to ensure taking corrective actions. However, the ICR does not report on the regularity of submission of reports to the Bank and the findings of the audit reports, including the auditors' opinions. The ICR also does not report on the FM rating in the last ISR filed before project closing.

c. Unintended impacts (Positive or Negative)

The ICR does not report any significant unintended impacts.

d. Other

(Reference ICR paras. 57 to 60).

Gender: The Project was not gender-tagged. The ICR reports (para. 59) that women constituted a very modest share (29,753 out of 545,828) of 5.45 percent of the farmers benefiting from areas with improved I&D services. These 29,753 female farmers also represented 16.25 percent of the 183,012 water users inducted as members of WUAs. However, the Project succeeded in improving the participation of women in FWS where women play a key role in curricula development and implementation. The ICR also affirms (para. 60) that no gender discrimination was noticed in any of the agencies involved under the Project.

Institutional Strengthening: This was a principal objective under the Project. Achievements were discussed earlier in Section 4.

Poverty Reduction and Shared Prosperity: The improved agricultural and water productivity supported by the Project resulted in increased agricultural output and cost savings to farmers, including those with lower incomes. The Project's financing of civil works also provided construction jobs to local beneficiaries which helped them during the COVID-19 pandemic. (ICR para. 58).

11. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Moderately Satisfactory	Satisfactory	In regard to pre-restructuring ratings, IEG rates efficacy as Substantial leading thereby to a pre-restructuring outcome rating of Satisfactory. This contributes



			to the overall outcome rating of Satisfactory.
Bank Performance	Satisfactory	Satisfactory	
Quality of M&E	Substantial	Substantial	
Quality of ICR	---	Substantial	

12. Lessons

(Reference ICR paras. 100 to 110).

The ICR lists a number of lessons from the Project experience which have relevance for similar projects carried out in comparable environments. From these, IEG derives the following lessons:

The role of institutions in molding appropriate water management practices is critical to the success and sustainability of an irrigation-based mode of agricultural production.

Sustainability of I&D investments requires the building of ownership by users and institutional capacity. The use of a phased approach (over a span of two projects) towards the restructuring of the water sector while improving the performance of irrigated agriculture helped in developing the necessary ownership and institutional capacity.

Sustaining beneficiary engagement and interest are critical for deriving the benefits from rehabilitated or newly built I&D structures:

The Project's experience has shown that farmers require support in adopting improved water management and agronomic practices that raise productivity while conserving resources. The outcomes under the Project demonstrated the feasibility of voluntary adoption of various resource-saving agronomic practices through training, capacity building, and showcasing opportunities for cost savings. Water User Associations (WUAs) proved instrumental in dissemination of relevant knowledge. It was observed that WUAs constituted through substantial community and mobilization and with support from non-governmental organizations became functional faster and performed better than those set up by the government agency (UPID). Since WUAs typically require 4 to 5 years of consistent support to become fully functional, additional external support through NGOs could prove helpful.

More explicit targeting and outreach to vulnerable groups is required to enhance benefits accruing to women, land-poor (or landless) farmers, and marginalized social groups.

While the Project achieved its target for number of women farmers, the overall proportion was low. A detailed gender gap analysis and creation of a Gender Action Plan (GAP) during project preparation could have helped increase the extent of female participation.



13. Assessment Recommended?

No

14. Comments on Quality of ICR

The ICR is well-written, candid, and generally follows the OPCS's ICR Guidelines (except in regard to length - 25 pages compared to the recommended 15 pages). It provides an adequate theory of change in regard to the causal links and the full results chain. The reporting is outcome focused. The analysis is generally evidence based but constrained to some extent by some relatively minor weaknesses in the Project's M&E system. The ICR does not provide an explanation of reasons for dropping the original PDO-level indicator for measuring increase in water productivity. The ICR provides lessons learned from the Project's experience that have broader relevance for similar projects executed in comparable environments. The ICR does have some minor shortcomings. The ICR does not clearly explain the reasons for the substantial reduction in project cost and what impact this had on achievement of the targeted outputs. In regard to compliance with safeguards, it does not report on compliance with three of the four triggered safeguards. In regard to fiduciary compliance, it does not report on the adequacy of financial management reporting and the nature (qualified or unqualified) of the auditors' opinions.

a. Quality of ICR Rating

Substantial