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Report Number : ICRR0021497

1. Project Data

Project ID	Project Name	
P099296	NP: Irrig & Water Res Mgmt Proj	
Country	**Practice Area(Lead)**	**Additional Financing**
Nepal	Agriculture	P114912,P144474
L/C/TF Number(s)	**Closing Date (Original)**	**Total Project Cost (USD)**
IDA-45150,IDA-53440,IDA-H3380,IDA-H9020	30-Jun-2013	103,315,203.74
Bank Approval Date	**Closing Date (Actual)**	
06-Dec-2007	30-Jun-2018	

	IBRD/IDA (USD)	Grants (USD)
Original Commitment	50,000,000.00	0.00
Revised Commitment	113,580,911.52	0.00
Actual	103,315,203.74	0.00

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

a. Objectives

The **Project Development Objectives** (PDO) of the Nepal Irrigation and Water Resources Management Project (IWRMP) as stated in the Financing Agreement dated January 31, 2008 (p.4) were "to improve irrigated agriculture productivity and management of selected irrigation schemes and enhance institutional capacity for integrated water resources management". The PDO remained unchanged in the subsequent Financing Agreements dated November 2, 2008 (p.4) and March 24, 2014 (p.4).

The PDO indicated in the Project Appraisal Document (PAD para.2) was the same but with additional specification that the primary target beneficiary groups of the project would be the water users of the selected irrigation schemes.

This Review's assessment of the project's achievements is against the project's objectives as stated in the original Financing Agreement.

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
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c. Will a split evaluation be undertaken?
No

d. Components

Component A - Irrigation Infrastructure Development and Improvement

(Estimated cost at appraisal US$42.59 million, actual cost US$68.89 million. The increase in component cost was due to the second Additional Financing (AF2) of US$31.0 million in December 2013, and a subsequent increase of the counterpart funding contribution.)

This component, implemented by the Department of Irrigation (DoI), aimed to improve irrigation water service delivery in selected schemes in the mountain, hill and terai areas, and to expand groundwater irrigation in the terai. The component was designed to address the following issues: (a) structural and operational weaknesses in the traditional Farmers-Managed Irrigation System (FMIS), resulting in low water use efficiency and low agricultural productivity; and (b) low exploitation of the groundwater potential of the Terai and lack of an appropriate plan for systematic development of groundwater irrigation.

Due to the substantial increases in the construction costs, the project's scale was reduced from 193 to 105 FMIS schemes and the total command area was reduced from 31,500 to 17,545 ha (Restructuring Paper June 2011, p.5). This reduction included (a) surface irrigation schemes from 168 to 96 FMIS; (b) deep tube well (DTW) groundwater irrigation schemes from 15 to 6 DTW clusters including new groundwater development in four clusters; (c) electrification of shallow tube well (STW) groundwater irrigation schemes from 10 to 3 STW clusters. However, savings in costs provided financing for an additional 31 schemes (AF2 Project Paper November 2013, p.9).

During the AF2 in December 2013, this component was proposed to improve irrigation service delivery through rehabilitation and modernization of additional 80 FMIS in 40 districts in the three Western region of the country, and through development of new and rehabilitation of existing groundwater irrigation schemes in the terai. The total command area of these additional schemes was estimated at 13,360 ha. AF2 also supported capacity development of WUA to manage, operate, and maintain the new or improved schemes.

Component B - Irrigation Management Transfer

(Estimated cost at appraisal US$11.06 million, actual cost US$24.36 million. The increase in component cost was due to the second Additional Financing (AF2) of US$12.84 million in December 2013, and a subsequent increase of the counterpart funding contribution.)

This component, implemented by DoI, aimed to improve service performance and service delivery of four out of 32 Agency-Managed Irrigation Systems (AMIS) in the terai through the completion and consolidation of management transfer to Water Users Associations (WUAs). The component was designed to address several issues in the AMIS which were large public irrigation schemes, including below-capacity performance, poor operation and maintenance (O&M), negligible cost recovery (below 5 percent on average) and inadequate maintenance. The component was therefore conceived to provide improved arrangements and instruments for O&M to AMIS by empowering WUAs to operate, maintain and manage parts of the irrigation systems for their sustainability, through the management transfer of four AMIS: Kankai, Sunsari Morang, Narayani, and Mahakali, to 24 WUAs covering the total area of about 61,000 ha.

The number of WUAs was reduced during early project implementation to 14 by merging sub-systems. Following the MTR in September 2010, the restructuring in 2011 (R1) proposed to reduce essential structural improvement (ESI) activities in four AMIS from 61,000 ha to 29,000 ha, to be managed by the four WUAs that had already signed an IMT agreement. This reduction was mainly due to the escalation of construction costs. In addition to the original four AMIS, the AF2 in December 2013 extended the scope to support the establishment and rehabilitation of irrigation infrastructure to three additional AMIS before the irrigation management transfer to respective WUAs. The total command area for these additional three schemes was about 16,500 ha.

Component C - Institutional and Policy Support for Improved Water Management

(Estimated cost at appraisal US$3.57 million, actual cost US$3.23 million. The increase in component cost was due to the second Additional Financing (AF2) of US$3.48 million in December 2013, and subsequent increase of the counterpart funding contribution.)

This component, implemented jointly by DoI and the Water and Energy Commission (WECS), aimed to provide more effective and streamlined water resources management services at the national and selected basin level through institutional strengthening of WECS and DOI for better administration and macro-management of the water resources. As the conventional approach in the water sector prioritized the provision of infrastructure and water rather than a sustainable and integrated management of water resources, this component addressed the sectoral issues concerning the lack of sufficient institutional capacity for undertaking effective planning and inter-sectoral allocation of water resources.

Activities under this component included: (a) establishment of a Water Resources Information Center (WRIC) in WECS; (b) preparation of a new integrated Water Resources Policy for approval; (c) preparation of draft amendments of Water Resources Act and related regulations for approval; (d) establishment of a telemetry system for real-time measurement of water availability and allocation in various water basins; (e) preparation of river basin water plans for two pilot basins (Narayani - *also known as Gandaki* - and Karnali Basins) which was later supplemented with financing from AF2 to two additional basins (West Rapti and Babai basins); (f) efficient performance of the OPD; and (g) establishment of M&E systems. In addition, this component also supported capacity building of WECS and DoI for implementing irrigation sector reform with a functional Management Information System (MIS) and an integrated M&E System.

Component D - Integrated Crop and Water Management

(Estimated cost at appraisal US$7.89 million, actual cost US$29.85 million. The increase in component cost was due to US$14.3 million from the first Additional Financing (AF1) from the Global Food Crisis Response Program (GFCRP) in September 2008, as well as US$8.28 million from the second Additional Financing (AF2) in December 2013, and subsequent increase of the counterpart funding contribution.)

This component, implemented jointly by DoI and DoA, aimed to increase production, productivity and profitability of agriculture and related production activities in schemes selected under the project. It addressed the issue of insufficient integration between agriculture and water management interventions in order to derive full benefits from investments in irrigation. Hence, this component was designed to integrate the irrigation system rehabilitation and improved irrigation service provided through components A and B with downstream agricultural activities. A total of 197 schemes assisted under components A and B was targeted covering 92,500 ha. The component was implemented following a community-based approach. Both DoI and the Department of Agriculture (DoA) jointly coordinated their activities with relevant WUAs. The schemes covered three agro-ecological zones i.e. the mountains, hills and terai.

On September 29, 2008, component D received the first Additional Financing (AF1) of US$14.3 million from the Global Food Response Crisis Program (GFRCP). Due to the high investment costs compared to the cost estimates at appraisal, first restructuring in June 2011 reduced the number of schemes from 197 (92,500 ha) to 109 (46,545 ha) (Restructuring Paper June 2011, p.5).On December 2013, the AF2 provided additional support for on-farm crop water management, improved cropping pattern, crop diversification and intensification, seed production at the community level, organized marketing, agricultural extension services, as well as support for Farmer Field School (FFS) to include water management aspects in addition to soil fertility and integrated pest management.

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

Project Cost

The estimated total cost of the project at appraisal was about US$64.91 million including US$2.63 million price contingencies. The actual cost reported in the ICR (Annex 3) was US$126.33 million.

Financing

- The Original Financing of the IWRMP was US$50 million from an IDA grant (IDA-H3380) which was approved on December 6, 2007. US$48.97 million was disbursed by 2015 Q2.
- The project received the first Additional Financing (AF1) of US$14.3 million in the form of IDA credit for component D (IDA-45150) from the GFCRP under Nepal Irrigation & Water Resources Management Supplemental Project (P114912). The AF1 was approved on September 29, 2008. US$13.52 million was disbursed.
- The project received the second Additional Financing (AF2) in the amount of US$20 million IDA grant (IDA-H9020) and US$30 million IDA credit (IDA-53440) under NP AF for IWRMP (P144474). The AF2 was approved on December 23, 2013. The project disbursed US$15.18 million from IDA-H9020 and US$25.65 million from IDA-53440.
- The total IDA financing was revised to US$113.58 million, of which US$103.32 million was disbursed equivalent to about 91 percent of the total allocation (ICR, p.2).

Borrower Contribution

At project appraisal, the Borrower (GoN) and beneficiaries (WUAs) were expected to contribute US$10.0 million and US$5 million of counterpart funds, respectively. The actual amounts contributed were US$17.94 million from GoN and US$7.42 million from WUAs (ICR Annex 3).

Dates, Additional Financing and Restructuring

- The IWRMP was approved on December 6, 2007 and became effective on April 24, 2008. The closing date for the original financing at appraisal was June 30, 2013.
- The AF1 from the GFCRP was approved on September 29, 2008 and became effective on January 30, 2009 with a closing date of June 30, 2013. The AF1 did not add new components to the IWRMP but provided financing to cover additional districts in marginalized communities with no potential for future development of surface irrigation and vulnerable to food shortages including the Koshi flood affected and food insecure districts. The goal of GFCRP was to address the short-and medium-term implications of the global food crisis for the country by strengthening agricultural supply response (GFCRP Emergency Project Paper, p.9). The AF1 focused on (a) small-scale and non-conventional irrigation; (b) scaling up community managed seed program and soil management activities; and (c) project coordination, impact evaluation and participatory beneficiary assessments (GFCRP Emergency Project Paper, p.1).

- The MTR on September 26, 2010 reported slow implementation progress, construction price escalation, inadequate price contingencies (4 percent), and low fund disbursements (17.5 percent) and, as a result, proposed the first restructuring (R1) in June 2011 to reduce the number of irrigation schemes and WUAs. The R1 also developed a detailed Governance and Accountability Action Plan (GAAP) to strengthen governance and accountability systems in the project and more broadly in the irrigation sector.
- On June 25, 2013, at the request of GoN, the closing dates for the original financing and AF1 were extended for one year from June 30, 2013 to June 30, 2014.
- The AF2 was approved on December 23, 2013 and became effective on April 10, 2014. The original closing date for AF2 was June 30, 2018. The AF2 aimed to complete the original commitment and to internalize, institutionalize and replicate the gains made in irrigation water management and agricultural policies. The original PDO and components remained unchanged.
- On June 26, 2014, at the request of GoN, the original financing and AF1 closing dates were extended for one more year from June 30, 2014 to June 30, 2015.
- On April 15, 2015, at the request of GoN, a second restructuring (R2) was approved to reallocate funds from underspent categories (civil works under component A and unallocated) for the ones that required more funds than initially estimated (strengthening of WUAs, technical assistance and logistics support).
- On June 19, 2015 a third restructuring (R3) was approved extending the closing date for the original financing and AF1 for one more year to June 30, 2016. These extensions were approved to complete the rehabilitation of irrigation schemes that were stalled following earthquakes on April 25, 2015 (7.8 on Richter scale) and May 12, 2015 (7.3 on Richter scale) including purchase of equipment.

Revised PDO Indicators

Although the PDO and project components remained unchanged during implementation, the two following PDO indicators were added during the first AF in September 2008 (Emergency Project Paper, p.39):

- Small-scale farming households had access to small and non-conventional irrigation (baseline 0; target 12,400)
- Satisfactory beneficiary scorecards/assessments (baseline 0%; target 80% positive response)

In addition, several revisions of the PDO indicators were made during the second AF in December 2013 as follows:

- The project management team reported difficulties in collecting data related to socio-economic indicators such as "satisfaction level" and "strengthening of WUA" for the PDO indicator "percent of

water users in the rehabilitated schemes satisfied with WUA". An external consultant was therefore engaged to carry out the measurement for this indicator.

- The indicator "Relevant community and productive assets formed through investment support provided" was dropped due to overcomplexity of measurement.
- The PDO indicator "Integrated national water resources database established" was dropped due to its early achievement.

3. Relevance of Objectives

Rationale

Nepal remains one of the poorest economies in Asia. Despite its sound economic growth, progress in poverty reduction and deterioration in income equality since the Peace Agreement in 2006 have fallen behind its neighboring countries in the region and Nepal is far from reaching medium-income level status. As 80 percent of the population reside in rural area, the agricultural sector remains the leading source of growth contributing about 30 percent to the total GDP and providing employment to more than 72 percent of the people across the mountains, hills and terai plains. However, the sector has yet to reach its full potential in agricultural productivity and to diversify farm production towards high-value products. Lack of access to modern inputs and technology, including inefficient irrigation systems in farmer-managed and large public irrigation schemes have led to low water use efficiency, factors impeding the achievement of pro-poor growth and improved livelihoods. In 2001, only 28 percent of Nepal’s arable land was irrigated, and most irrigation systems were farmer-managed and in dire need of modernization and rehabilitation.

At project appraisal, the PDO was in principle highly relevant to the goal of the National Water Plan (2005) which was prepared to operationalize the Water Resources Strategy (2002). The overarching goal of both plans was to meet the country water supply needs and to achieve its long-term sustainability with recommendations for short-, medium- and long-term action plans for the development of the water sector based on investment projects and institutional reorganization. The IWRMP therefore was directly supporting these plans to provide a systematic framework for the integrated development and management of national water resources and services. The PDO was also highly relevant to the priority outlined in the Nepal Agriculture Perspective Plan (APP: 1995-2015) and the country’s Tenth Plan of Poverty Reduction Strategy Paper (2006) which aimed to promote year-round irrigation facilities on arable land, to also ensure the sustainable management of development irrigation systems, and to support non-conventional irrigation to channel benefits to the poor. In addition, the PDO at appraisal was highly relevant to the Bank’s Country Assistance Strategy (CAS 2004-2007) to help the country refocus its agriculture and rural development strategy, especially policies related to factor markets and to support irrigation reforms, agricultural diversification and market development. Specifically, the CAS planned to improve efficiency of surface irrigation and transfer full O&M responsibility to farmers and to promote agricultural diversification as a milestone towards the CAS outcomes.

At project completion, the PDO remained in line with the Nepal development priority as reflected in the Irrigation Policy Amendment (2013) and the Irrigation Bill (2015). The PDO at closing also remained consistent with the Bank's Country Partnership Strategy (CPS FY2014-18) and the current Country Partnership Framework (CPF 2019-2023).

Conclusion. The PDO was in principle highly relevant to Government and Bank development strategies. On the other hand, the second and third elements, namely to "improve irrigated productivity and management" and "to enhance institutional capacity" were ambiguous objectives not defined by the project's key performance indicators leading to complications in measuring the achievement of these objectives. The relevance of the PDO is therefore rated Substantial.

Rating
Substantial

4. Achievement of Objectives (Efficacy)

Objective 1
Objective

The PDO was "to improve irrigated agriculture productivity and management of selected irrigation schemes and enhance institutional capacity for integrated water resources management". It contains three sub-objectives referred to in this review as Objectives 1, 2 and 3:

- Improve irrigated agriculture productivity;
- Improve management of selected irrigation schemes; and
- Enhance institutional capacity of integrated water resources management.

The evidence on outputs and outcomes below for all objectives is drawn from the ICR, Annexes 1A and 1B.

Objective 1 - "Improve irrigated agriculture productivity"

Rationale

Theory of change. The ICR indicates that the development and modernization of irrigation systems, and enhanced production support services through integrated crop and water management will result in the improved performance of irrigation systems, more efficient agricultural production and crop diversification using enhanced technology, resulting in the improved productivity of irrigated agriculture (Figure 1).

Outputs:

- 764,612 water users provided with new/improved irrigation and drainage services (component A - 384,361 and component B - 380,251) (baseline 0; target 415,200). A precise differentiation in the ICR between "new" and "improved" irrigation and drainage services would have been more informative for monitoring and evaluation of the outcomes of project investments.
- 73,876 ha provided with new/improved irrigation or drainage services (component A – 34,095 ha, component B – 39,300 ha, and component D – 481 ha) (baseline 33,106; target 72,867). Again, a precise differentiation in the ICR between "new" and "improved" irrigation and drainage services would have been more informative for monitoring and evaluation of the outcomes of project investments.
- 81% of "tail-enders" reporting improved water availability. The data were derived from a household survey and Focus Group Discussion (FGD) compiled in the Monitoring Report (March 2018) (baseline 0%; target 60%)
- A total of 230 FMIS (ICR para.30) (128 from original financing and 102 from AF2) rehabilitated covering an area of 34,095 ha (18,733 ha from original financing and 15,362 ha from AF2) (baseline 0; target 193 FMIS and 31,550 ha; revised AF2 target 239 FMIS and 38,827 ha)
- 100% of delivery points receiving proportionate share of water (baseline 0%; target 90%; revised AF2 target 100%)
- 80% average value for adequate O&M expenditures by DoI and WUA according to agreed Asset Management Plans in 5 out of 7 schemes (baseline 0%; target 85%; revised AF2 target 100%).
- Essential structural improvements were completed in seven AMIS supporting 39,300 ha (65,718 households) (baseline 0 ha; target 61,000 ha; revised MTR target 26,000 ha)
- 59% of farmers in the selected schemes adopting demonstrated techniques (baseline 0%; target 20%; revised AF2 target 60%)
- A total of 3,491 small irrigation schemes were supported for minor rehabilitation works covering an area of 373 ha (28,394 households)
- Increase in seed replacement rate on farms for selected main crops (%) based on the project internal assessment report (2018) and summarized in the OPD's Project Completion Report:
    - Rice – 13% (baseline 6%, target 10%, revised AF2 target 13.01%)
    - Maize – 16% (baseline 6%, target 10%, revised AF2 target 16.01%)
    - Wheat – 12% (baseline 7%, target 10%, revised AF2 target 10.9%)
- 28,394 small-scale farming households had access to small and non-conventional irrigation (baseline 0; target 12,400). ICR (p.41) further indicated that micro-level non-conventional irrigation schemes were implemented through local NGOs covering an area of 108 ha (2,318 households).
- 98% positive response for the satisfactory beneficiary scorecards/assessments (baseline 0%; target 80% positive response)
- The ICR reported additional project outputs achieved under the Nepal Food Crisis Response Program (AF1) including construction and rehabilitation of 3,491 small irrigation schemes on 5,678 ha of command area, benefitting 28,394 farm households (target 12,400 households) resulting in an average increase in cropping intensity by 20%.

Outcomes:

- Increased productivity of selected main crops based on baseline and impact assessment surveys conducted by external consultancies and summarized in the OPD's Project Completion Report:
  - Rice – 4.38 Mt/ha achieved (baseline 2.9; target 3.5; revised AF2 target 3.8)
  - Wheat – 3.09 Mt/ha achieved (baseline 2.0; target 2.8; revised AF2 target 3.2)
  - Maize – 4.66 Mt/ha achieved (baseline 2.1; target 3.2; revised AF2 target 3.6)
  - Potato – 17.83 Mt/ha achieved (baseline 10.0; target 14.0; revised AF2 target 16.0)
- 243% increase in cropping intensity according to the OPD's data from baseline and impact assessment surveys. However, the ICR (p.13) used the endline survey data to calculate weighted averages for all FMIS and AMIS financed by both original financing and AF. The actual cropping intensity is 219% (baseline 168%; target 205%; revised AF2 target 220%).
- 388,604 female water users provided with irrigation and drainage services (baseline 0; target 215,904)

Conclusion. The outcomes show a substantial and systematic increase in agricultural productivity and cropping intensity for selected main crops which arguably resulted from improved irrigation infrastructure and integrated crop and water management. There was, however, no counterfactual analysis provided in the efficacy section of the ICR despite the available data (from the baseline and impact assessment surveys) on an improved agricultural productivity and cropping intensity "with-without" the project reported in the ICR's efficiency analysis (Annex 4, Tables 4.9 and 4.10). Based on all the data available this review has rated the efficacy of this project's achievements toward Objective 1 as substantial.

Rating
Substantial

Objective 2
Objective

"Improve management of selected irrigation schemes"

Rationale

Theory of Change. The ICR indicates that together with the irrigation infrastructure modernization, the completion and consolidation of integrated irrigation management transfer (IMT) to the water users associations (WUAs) will enhance the capacity of WUAs to manage the irrigation scheme and enable the WUAs to gradually assume full responsibility for the operation and maintenance (O&M) of the irrigation systems in the command areas, leading to an improvement in the management of the selected irrigation schemes (Figure 1).

Outputs:

- All 230 (component A – 223 FMIS; and component B - 7 AMIS) Water Users Associations (WUAs) were formally constituted and are holding regular meetings (baseline 0%; target 90%; revised AF2 target 100%)
- 73% of 223 Farmer-managed Irrigation Systems (FMIS) WUAs collecting water charges (cash, in-kind and labor) required for adequate O&M (baseline 0%; target 80%; revised AF2 target 100%). The Irrigation Service Fee (ISF) collection plan was prepared for 71 FMIS and of which 48 FMIS had ratified the plan by their general assembly, the remaining 23 FMIS were under the process of ratification by concerned WUAs.
- All 223 FMIS WUAs maintaining appropriate accounts and cash registers (baseline 0%; target 80%; revised AF2 target 100%)
- 8,181 ha additional area irrigated by groundwater from DTW (baseline 0 ha; target 900 ha; revised AF2 target 8,725 ha)
- All 7 WUAs in Agency-managed Irrigation Systems (AMIS) were formally constituted and holding regular meetings (baseline 0%; target 90%; revised AF2 target 7 WUAs).
- All of 7 AMIS WUAs collecting water charges (cash, in-kind and labor) required for adequate O&M (baseline 0%; target 85%; revised AF2 target 5 WUAs).
- All of 7 AMIS WUAs maintaining appropriate accounts and cash registers (baseline 0%; target PAD 85%; revised AF2 targets 7 WUAs).
- The ICR (p.35 and p.37) noted that the measurement unit for these three outputs was changed from percentage in the PAD to number during the AF2 as only 7 AMIS WUAs planned to be intervened. However, the indicator with a percentage value was retained in the Results Framework portal.
- Capacity building of 233 FMIS WUAs through 1,006 training events and trained 28,241 people (48% of whom were women). However, the training program faced numerous challenges (i.e. long distance, lack of social mobilization staff, lack of physical WUA offices, low capacity of WUAs to maintain financial and written records). As a result, the training activities for the water charge collection required for adequate O&M were completed only towards the project ending, leaving this output fall short of target by 17%.
- The Asset Management Plans (AMP) were prepared and transferred to all seven AMIS WUAs and provided 520 trainings to 19,013 participants (25% of whom were women). Although the actual ISF collection was lower than the targets set for each WUA to cover their O&M, the trend of ISF collection continued to increase, where in-kind contributions were found to be higher in value and closer to targets than cash income

Outcomes:

- An average of 94% of seven AMIS WUAs in transferred irrigation schemes whose O&M expenditures were as per Asset Management Plans (individual percentage for each AMIS were: Kankai Irrigation Scheme (KIS) – 141%, Sitagunj Irrigation Scheme (SIS) – 75%, Narayani Irrigation Scheme-2 (NIS-2) –

103%, Narayani Irrigation Scheme-8 (NIS-8) – 57%, Mahakali Irrigation Scheme-1 (MIS-I) – 137%, Mahakali Irrigation Scheme-2 (MIS-II) – 80%, and Ramgunj Irrigation Scheme (RIS) – 71% (baseline 0%; target 85%)

- Average 87% of water users in both FMIS and AMIS rehabilitated schemes were satisfied with WUAs (baseline 0%; target 60%; revised AF2 target 70%). This indicator was monitored using "yes/no" question. In case of FMIS, the sample survey of 32 FMIS showed that 96% of all farmers rated the performance of their respective WUAs as good or acceptable.
- 230 operational WUAs created and/or strengthened (component A – 223 or 233 FMIS; and component B - 7 AMIS WUAs) (baseline 0%; target 221).

Conclusion. Despite moderate shortcomings in completion of activities, all performance indicators exceeded the targets at the outcome level. With a significant progress in creating and/or strengthening the WUAs, O&M maintenance according to the AMP, and satisfaction of water users with WUAs in both FMIS and AMIS rehabilitated schemes. These achievements show the capacity of the WUAs to assume responsibility and leadership to improve the management of modernized irrigation schemes. Nonetheless, given more intensive support required to "create" new operational WUAs than to "strengthen" existing ones, it would have been more informative to identify the establishment of new WUAs and the strengthening of existing WUAs as separate outcomes. In addition, as for Objective 1, there was no counterfactual analysis. Overall, however, this review rates the efficacy of the achievements toward Objective 2 as substantial.

Rating
Substantial

Objective 3
Objective

“Enhance institutional capacity of integrated water resources management”

Rationale

Theory of Change. The ICR indicates that the capacity-building activities to strengthen institutional and policy support for improved water resources management, through developing an integrated water resources policy and appropriate regulatory framework, will result in the enhanced institutional capacity of integrated water resources management (Figure 1).

Outputs:

- Enhanced capacity of Water and Energy Commission Secretariat (WECS) for planning, monitoring and inter-sectoral allocation of water resources:
  - The Water Resources Information Center (WRIC) was established at WECS and is expected to become the national center that develops and maintains a national water resources database, and disseminates water-related data to interested users.
  - To facilitate the operation of WRIC, a computerized and GIS-based Water Resources Information System (WRIS) was developed. However, the ICR (para.39) noted a concern over the functionality and sustainability of WRIC and WRIS due to the inadequate staffing and budget at WECS.
- Integrated national water resources data base established (pooling available data) and fully in operation. This output was achieved before the AF2 and hence was dropped in the final RF (AF2 Project Paper 2013, p.17).
- 36 real-time wireless telemetry systems established in targeted basins (Narayani, Babai, West Rapti and Karnali) over 9 hydrological and 23 meteorological stations (baseline 0; target vaguely defined in PAD as "systems fully operational"; revised target at AF2 15). In addition, 11 hydro-met stations were upgraded and information from telemetry systems was uploaded into the WRIS.
- Legal and administrative management of water resources and irrigation-related services were partially streamlined:
  - Preparation of an Integrated Water Resources Policy (IWRP) was substantially delayed due to initial challenges in recruiting consultants which led WECS to form an in-house taskforce in July 2009. By project closing, a draft IWRP was prepared and submitted to the GoN for approval. However, the recent political restructuring would require the draft policy to be substantially revised.
  - The concept and the mandate of the regional cooperation cell for trans-boundary water management were approved by the 54th meeting of WECS in November 2009. The cell was established with the operational responsibility entrusted to a Joint Secretary of WECS.
- To prepare the country for a basin-level approach to water resource management, two river basin offices (RBOs) were set up at Nepalgunj (Karnali basin) and at Narayanghat (Narayani basin) jointly by WECs and the Department of Hydrology and Meteorology. These RBOs would be responsible for developing guidelines and decision-making tools for the sub-basins and providing training to the stakeholders (baseline 0; target 2).
- None of the integrated river basin plans was prepared and finalized for two basins (baseline 0; target 2; revised AF2 target 4). This activity was not completed due to substantial delay in hiring of consultants and the US$3.5 million budget for this was consequently cancelled. Several days before project closing (June 26, 2018), WECS signed the contract with an international consultant firm and commenced the work at the time of ICR preparation in August 2018. WECS secured funding for this activity until December 2019 from the South Asia Water Initiative (SAWI) through the Bank and the GoN and has made a commitment to complete the work. Nonetheless, the continuation of this activity after project closing restrains the attribution of this output achievement to the project's investment. At the time this ICR Review was prepared, the Bank task team informed IEG that the preparation of river basin plans, with additional funding support from the South Asia Water Initiative (SAWI), has fully started with the key stakeholder consultation meetings in all the seven new Provinces/States and the initiation of hydrological modelling for Koshi River Basin.

Outcomes:

All indicators defined to assess the achievements of this objective in PAD and ICR were output-level indicators and the ICR treated the formulation of objectives as the outcome indicator itself, yet without corresponding measures or targets. In response to an IEG query, the Bank task team provided following information regarding outcome-level achievements of the Objective 3 in relation to outcome-level indicators which were discussed in the Project Concept Note:

- Water and Energy Commission Secretariat (WECS) was developed into an apex normative and regulatory body for overseeing planning for integrated development, management and regulation of water resources.
- WECS/water institutions become capable to resolve multiple water use and allocation issues in selected river basins.
- WECS is able to take the leadership and guide the consultants in the preparation of river basin plans and is actively participating in stakeholder discussions in the river basins.

Conclusion, Despite the partial achievement of some of the intended outputs, the ICR did not elaborate on the output indicators regarding efficient performance of the Office of the Project Director, and establishment of M&E systems at the field, regional, and central levels which were proposed in PAD (para.23). Due to the slow progress and low expenditure for enhancing Nepal's capacity for integrated water resource management highlighted during MTR in 2010, it was agreed to continue with the capacity building efforts on the condition that WECs would allocate more staff and procure the needed hardware and software (MTR Aide Memoire 2010 para.6). The Bank task team indicated to IEG that the progress of river basin plan development at MTR was limited as the available funds were sufficient for data collection but inadequate to support the river basin modelling task. Six months after the first project extension in June 2013 to complete the original work for one year, the AF2 was approved at the request of WECS to include 2 additional basins for the development of integrated river basin plans for wider coverage, despite the severe delay in completing the plans for the initial 2 basins which had paradoxically overstretched the limited capacity of the institutions this project was intended to strengthen. Although the Bank task team identified evidence that the institutional capacity of WECS was enhanced as a result of the project activities, the strengthening of capacity for integrated water resource management was only partially achieved. Work is, however, currently underway to develop water basin plans that were not completed before the project closed. Nevertheless, based on actual accomplishments, this review has rated the efficacy of the project's achievements toward Objective 3 as modest.

Rating
Modest

Rationale

The ICR's efficacy analyses focused entirely on the project's achievements compared to the project's targets and there was no counterfactual analysis. Hence there was no explicit evidence that the project's achievements were uniquely attributable to the project's investments. On the other hand, the ICR's analysis of the project's efficiency shows a substantial increase in agricultural productivity and cropping intensity compared to increases without the project. In addition, irrigation farmers rated the performance of WUAs (responsible for managing irrigation schemes at the farm level) as good or acceptable. These results were positive and supported an overall rating for the efficacy of the project's achievements as substantial.

This review therefore rates the overall efficacy of the project's achievements as Substantial.

Overall Efficacy Rating
Substantial

5. Efficiency

Economic Efficiency

The PAD estimated potential B/C ratios and Economic Internal Rates of Return (EIRRs) for each representative scheme and an average of all schemes. Over an assumed 20 years project life, the streams of expected benefits were discounted at 12% opportunity cost of capital (OCC) for improved surface and groundwater irrigation, adoption of improved farming practices (including adoption of high-yielding variety) based on year-around increase in cropping area, crop productivity, cropping intensity, crop diversification into vegetables and other high value crops. All financial and economic prices were adjusted to constant 2006 values. However, the PAD did not provide the assumptions used in its economic analysis such as baselines and expected future levels of crop yields, intensity and diversification, and benefit accumulation phases. The project was expected to produce an average of EIRR of 34.79% for all schemes. In addition, the PAD performed sensitivity analysis with seven possible risk scenarios. The switching value analysis further showed that, at 12% OCC, the average benefit has to decline by 23%, or the average cost has to increase by 96% for the project to give zero return (NPV = 0). The PAD Tables 10, 11 and 12 reported the project's economic efficiency and sensitivity analysis as follows:

Schemes	EIRR (%)	EBCR	ENPV of Incremental Benefit/ha/year (NPR/ha)	EIRR at 25% investment cost increase and benefit lag by 1 year (%)
Mountain	16.38	1.21	31,828	9.62
Hill	47.83	2.64	185,092	25.68

Terai	28.31	1.75	41,355	18.91
DTW (Electricity)	13.93	1.11	12,681	9.22
DTW (Conversion)	52.63	1.88	27,012	29.65
AMIS (IMT)	49.65	2.57	26,903	22.79

Due to the emergency response nature and similar geographical coverage to original financing, the AF1 received under the GFCRP in September 2008 was not required to reassess the economic and financial analysis for the AF investments (ICR Annex 4). Following the MTR, the R1 in June 2011 reduced the project scope by half. As the downsizing was triggered by the slow and inefficient progress on implementation and the underestimation of the project costs at appraisal, the project's economic efficiency was re-estimated. Using the same assumptions as at appraisal (12% OCC and 20 years project life), the EIRR was estimated at 19.74%, ENPV at NPR40,804/ha, and economic benefit cost ratio (EBCR) at 1.83.

The AF2 in December 2013 included economic rates of return prepared by FAO showing that major types of schemes were viable in economic terms, although no information on key cost and benefit assumptions was given. The re-estimation showed positive EIRR for all FMIS ranging from 13% (surface irrigation in the mountains) to 30% (surface irrigation in the hills). There was no estimate of the overall EIRR for the whole project. The ENPV was lowest for the mountains scheme (NPR 0.8 million) and highest for the terai scheme (NPR 58.8 million).

At project closing, the ICR re-estimated the economic appraisal in 2018 prices for three representative surface schemes, an aggregation of DTW and STW terai groundwater scheme (since the share of the STW schemes was less than 10% and the results were not monitored separately), as well as the overall project. The ICR analysis assumed 20 years project life and, without justification, a 5% OCC. Using the actual changes to crop productivity, cropping intensity, diversification data (from baseline and impact assessment surveys), and technology adoption rate data (from the project internal assessment report, 2018), the ICR Table 4.13 reported on the project's economic efficiency analysis as follows:

Schemes	ERR (%)	EBCR	ENPV (NPR/ha)
Mountain – surface	17.83	2.34	133,147
Hill – surface	18.36	3.14	338,188
Terai – surface	18.14	2.93	330,057
Terai – groundwater	18.57	3.34	87,319
AMIS (IMT)	24.18	4.89	185,547
Overall project	23.64	4.21	255,083

The ICR also provided a sensitivity analysis using four scenarios: (a) cost increased by 20%, (b) benefits decreased by 20%, (c) benefit accumulation delayed by 2 years, and (d) simultaneous cost increased and benefit declined by 20%. The analysis concluded that the project was moderately sensitive to all variables and the ERR remained well above 5% OCC for all four scenarios, ranging from 17.4% in scenario (c) to 21.8% in scenario (b). The financial analysis results at appraisal reported in PAD and at closing reported in ICR are similar to the results of the economic analysis.

Considering drastic cost underestimation at appraisal, unavailability of assumptions used in previous analyses, prices used in different years, and inconsistency in estimation of overall project and scheme-level returns, it is impractical to evaluate the economic efficiency over the entire project life through a comparison of the analyses at appraisal, restructurings and ICR. The robust and positive returns at scheme- and project-level analysis at closing from the ICR implied a substantial economic efficiency of the project investment despite initial cost overruns, reduction in project scope, and implementation delay.

Since no information was given in the PAD and the ICR, the percent of total project cost for which ERR calculated below was an approximation assuming that the economic efficiency analyses were based on activities in components A, B and D. An overestimation of coverage is probable as some activities in component B were not related to the estimation of future benefit streams.

Administrative Efficiency

With two additional financings, one major restructuring, and three extensions of the closing date, the IWRMP closed 5 years later than expected. This was due to the underestimation of the project's cost and insufficient price contingencies at appraisal, and additional project activities in extended project areas that came with AF1 were the main causes for implementation delay which led to the MTR restructuring and first extension of the original financing. Six months after the first extension, the project absorbed AF2 to complete the initial activities and take on additional ones, with higher revised targets.

Given the complexity of the project which included additional financing (AF1 and AF2) this review rates its administrative efficiency as effective.

Conclusion: Based on the ICR's estimate of an economic rate of return for all major irrigation schemes in this project close to or above 20%, the relative robustness of these results in the face of separate and simultaneous increases and decreases in costs and benefits of 20%, together with effective administrative efficiency, this project's overall efficiency is rated 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	✓	34.79	93.40 ☐Not Applicable

ICR Estimate	✓	23.64	97.40 ☐Not Applicable

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

6. Outcome

The relevance of this project's objectives was rated substantial. Although river basin plans were not completed before the project closed, yields of major irrigated crops had increased considerably and irrigation management under water users associations had improved measurably to the satisfaction of irrigation farmers, the efficacy of the project's achievements was rated substantial. The project's efficiency was also rated substantial because of high and robust rates of return and sound administrative efficiency. Therefore, even with the shortcomings identified for Objective 3, the project's overall outcome is rated as Satisfactory.

a. Outcome Rating

Satisfactory

7. Risk to Development Outcome

- **Government commitment and ownership risk**

Following the elections that took place between May and December 2017, Nepal is undergoing a historical political transformation envisaged in the Constitution to restructure the State into seven provincial assemblies alongside the provincial governments and the federal government. With the on-going federalization, there are concerns about the capacity of provincial governments to allocate sufficient staffing and fund flow and that consequently both irrigation and agricultural services could be disrupted in the short-term. Furthermore, although the Integrated Water Resources Policy (IWRP) was drafted and submitted to GoN for approval at project closing, a substantial revision of this draft policy will be needed to reflect the federalization. The ICR also noted a risk that the management obligations and responsibilities as agreed under component B may not be met, as the GoN budget and AMIS WUAs collection of ISF may not be adequate to jointly maintain the large irrigation systems in the terai.

- **Institutional support risk**

While IWRMP was instrumental in building the potential of the FMIS WUAs to assume full responsibility for the O&M of the new/rehabilitated infrastructures, the implementation delays of training activities spawned the risk of sustainability and inadequate institutional capacity after project closure. The FMIS WUAs are expected to address capacity issues to mobilize all farmers for canal maintenance, carry out all their responsibilities, and create more awareness among farmers on the WUA functioning. In addition, the slow involvement of the Irrigation Management Division (IMD) in the management transfer of AMIS and strengthening of the WUAs entailed the risk that institutional strengthening activities will be discontinued by the IMD.

- **Exposure to natural disasters**

Nepal is among the 20 most disaster-prone countries in the world (Nepal Disaster Report, 2017) with risks of a multitude of natural hazards such as floods, landslides, windstorms, hailstorms, fires, earthquakes and Glacial Lake Outburst Floods. The risk of massive earthquake is particularly high due to its location in a seismically active zone. Given the current dynamics of the federalization across multi-layer government levels questions arise about the uncertainty that the WUAs and FMIS might face regarding support to maintain the irrigation systems in general, and in particular during natural disasters.

8. Assessment of Bank Performance

a. Quality-at-Entry

- To ensure transparency and accountability in service delivery at the onset, the project drafted a clear agreement between WUAs and DoI about respective roles and responsibilities, appropriate financing arrangements, and monitoring compliance by both parties. The project also included a detailed IMT process along with appropriate governance structures.
- At appraisal, the three sources of risks to the achievement of PDO were adequately identified (PAD para.68). These included (a) worsening of the political environment; (b) weaknesses in project design; and (c) weaknesses in implementation arrangements. For each type of risk, mitigation measures were proposed. However, risks from natural hazards were not anticipated despite a considerable likelihood given the historical records and the country's geography. As elaborated earlier, a series of natural disasters substantially disrupted the project implementation.
- The quality at entry was essentially affected by the technically erroneous assumption on the projected inflation rate and a pervasive underestimation of project costs for civil works. Without sufficient price contingencies embedded in the budget, the project was bound to reduce its scope in June 2011.
- The economic and financial efficiency analysis at appraisal did not describe assumptions for the baseline and future benefit stream from cropping improvement, and the scopes of opportunities for projected expansion of command areas. The subsequent efficiency analyses at MTR and AF2 were

brief and lacking coherence in terms of methods and perspective of calculation, making it impossible to compare the project efficiency over time.

Quality-at-Entry Rating
Moderately Unsatisfactory

b. Quality of supervision

- The ICR recorded that the Bank's task team provided extensive and regular implementation support through supervision missions at least twice a year and timely preparation of Aide Memoires. The country-based team was instrumental in project implementation with constant consultation and support. The ICR also states that Sector/Practice and Country Management provided practical guidance to the task team during project implementation. The task team systematically communicated between GoN and the project team regarding issues that arose during implementation and provided advice. The task team also consistently alerted the project team to establish an M&E system and to undertake periodic monitoring.
- The project received comprehensive and candid progress reviews with the first MTR of the original scope in September 2010 and the second MTR of AF2 in August 2016.
- Project implementation did not experience abrupt turnover besides a transition of team leadership by attrition in October 2010 and as a result of World Bank by organizational restructuring in 2012 which placed the project under the Agriculture Global Practice.
- The quality of supervision was strengthened following AF2 when all future implementation reviews were required to follow up and report on the Governance and Peace Action Plan (GPAP) in detail. As a supplementary measure to expedite the decision-making process, the AF2 recommended that the project team prepare a checklist of procurement procedure to fully cover the relevant steps and reference to auxiliary staff in the absence of primary staff.
- Supervision was disrupted by the abrupt change of the terms of reference (TOR) due to the changes in the Bank and the GoN agreement for technical consultant for the river basin plans development activity under component C. Towards the final stage of the consultant recruitment process, the Bank and the GoN revised the scope of this activity that the river basin plan would need to cover all the major rivers in Nepal with broader services including hydropower master plans (ICR para.73). The modification of TOR prompted a re-initiation of the selection process and delayed the contract signing until several days before the project closing.

Quality of Supervision Rating
Satisfactory

Overall Bank Performance Rating
Moderately Satisfactory

9. M&E Design, Implementation, & Utilization

a. M&E Design

- The M&E designed at appraisal was based on facilitating (a) results-based management; (b) learning and process enhancement through process monitoring by participatory methods involving reviews and satisfaction surveys; and (c) impact evaluation involving the use of appropriate baseline and controls.
- The Office of Project Director (OPD) was given overall responsibility for planning and coordinating M&E activities as an integrated intervention across (a) the implementing departments/agencies (e.g. DoI and DoA) including at the regional and district levels; (b) external M&E consultants for surveys at baseline, midterm and endline; and (c) beneficiary WUAs and other relevant stakeholders. The appraisal envisaged a dedicated M&E unit in the OPD.
- The project Results Framework (RF) at appraisal was subject to frequent change of output and outcome targets (addition, revision, removal) and their unit of measurement throughout the implementation period. Although important indicators such as gender should have been included in the beginning, they were added only at AF2. The safeguard policy for Projects on International Waterways was triggered at appraisal but dropped and replaced by a policy for Pest Management during AF2.
- While the RF elaborated the outcome indicators for the first two sub-objectives ("to improve and irrigated agriculture productivity and management of selected irrigation schemes"), it was unclear how the intended outcome of the third sub-objective ("to enhance institutional capacity for integrated water resources management") should be captured and evaluated. All the indicators under this sub-objective were intermediate outcome (output) levels.
- Several output/outcome measurements were vague and lacked of guideline on how to capture and evaluate these variables, such as "satisfaction level" and "strengthening of WUA". As a result, the indicator "percent of water users in the rehabilitated schemes satisfied with WUA" was not monitored until a consultant was hired after AF2, and the output "Relevant community and productive assets formed through investment support provided" was dropped during AF2 due to overcomplexity of measurement.

b. M&E Implementation

- The project conducted a number of data collections for periodic project monitoring and impact evaluation. These included baseline study at the project onset, a survey based on a representative sample of

households in the command area to establish a pre-intervention baseline, training needs assessment of the WUAs, impact study on groundwater irrigation, final impact assessments for component A (separate reports for Far-Western, Mid-Western, and Western regions) and component B (separate reports for Kankai, Mahakali, Narayani and Sitagunj), Project Completion Report for component D, evaluations of Social and Environmental Management Plan (SEMP) implementation, the integrated Project Completion Report (PCR) for the entire project prepared by the OPD.

- The project maintained the website (www.dwri.gov.np/iwrmp) hosted under the Department of Water Resources and Irrigation. This website was dedicated exclusively to the project with all the information about the project activities (both original scope and AF) and project team, including the repository of the project documents, project reports, tender notice, and photo and gallery.
- Two M&E experts were mobilized one each for components A and B for regular reporting on M&E activities.
- In contrast to the integrated M&E approach led by OPD envisaged during appraisal, each project component implemented M&E system largely independently with autonomous information databases and reporting to its respective component leader (MTR 2010 para.78). The lack of coordination and integration between DoI and DoA which conducted their M&E activities separately rendered the M&E implementation ineffective during the entire project. Both agencies had internal systems and standardized processes in place to follow the implementation progress, but their systems operation did not contain an evaluation of project results and most outcome results were instead collected through consultants and surveys (ICR para.76). Following regular recommendations from the Bank for a unified and comprehensive approach to M&E implementation, a thorough integrated analysis of project activities was carried out for the Government's project completion report (PCR) only at closing.

c. M&E Utilization

- Although the M&E reports were prepared individually for each component, they were utilized effectively to signal the need for the AF and project restructuring in a timely manner.
- However, as described above, the lack of coordination between the OPD and the implementing agencies (DoI and DoA) was the main cause for ineffective M&E utilization for the entire project duration. During the first MTR in 2010, it was observed that a vast amount of data collected for component A available at the district level was not standardized which made the data transfer to the regional and central levels imprecise and outdated.
- The lack of an integrated M&E approach was a challenging factor to create a central database as the data remained in files, reports, and at the field level. With no centralized information, OPD was not able to prepare reports for the district and regional level to guide sub-project management as planned at appraisal. Since the M&E approach was not user-driven, field staff were not fully recognized as key stakeholders and much less as audience for M&E reports to disseminate project implementation status, lessons learned and recommendations for improvements (MTR 2010 para.82).

- With no central database and integrated M&E approach, the M&E utilization was limited and it was difficult for stakeholders to fully capture and connect the key contributions achieved under each component to arrive at the overall PDO throughout the 10-year project period.
- The ICR (para.77) noted that "The main weaknesses in M&E utilization … were lack of coordination between the OPD and the implementing agencies in carrying out M&E activities and, therefore, lack of integrated M&E analysis for the entire project during project implementation. This consequently limited the ability of all involved parties … to see the bigger picture of how key contributions achieved under each project component complement each other and feed into meeting the overall PDO". Indeed, given that the M&E system was underutilized and ineffective throughout the project period, it is likely that the overview of the project's progress towards the PDO and the linkages between various project's activities were unclear. Nonetheless, the ICR concluded that this lack of clarity among project stakeholders was resolved with the OPD's comprehensive PCR and final reporting on the project's achievements.

M&E Quality Rating
Modest

10. Other Issues

a. Safeguards

At appraisal, the project was classified as Category 'B' since the project's civil works would be implemented following environmental-friendly construction approaches and involving mainly rehabilitation of existing structures. This category triggered four safeguard policies: Environmental Assessment (OP 4.01), Indigenous Peoples (OP 4.10), Involuntary Resettlement (OP 4.12) and Projects on International Waterways (OP 7.50). Although the project was not involved with purchasing or promoting the use of chemicals, project activities related to cropping intensification was likely to attract the use of pesticides. The additional Pest Management (OP 4.09) safeguard policies was therefore triggered during AF2. The ICR noted that no significant adverse environmental and social issues or impacts were encountered during the implementation (ICR para.79).

Environmental Safeguards. As part of the project preparation, an Integrated Social and Environmental Assessment (ISEA) was carried out in 13 sample irrigation schemes including consultation with stakeholders. The ISEA included an Environmental and Social Management Framework (ESMF) for systematic management of the potential impacts. All sub-projects were subjected to social and environmental screening and field verification against the set of environmental and social criteria derived from the GoN regulation and the Bank's safeguard policies. In addition, each sample scheme sub-project needed to prepare its own integrated Social and Environmental Management Plan (SEMP), and if screening was required, to undertake Initial Social and Environmental Examination (ISEE) or detailed Social and Environmental Assessment (SEA). The ESMP also required monitoring of all sub-projects at all levels at different stages of implementation. The ESMF remained valid for the entire project implementation and 239 sub-project specific SEMPs were implemented with satisfaction.

Indigenous Peoples Safeguards. At appraisal Vulnerable Group Development Strategy was prepared to ensure that meaningful consultations were held with Indigenous Peoples and vulnerable groups (women, Janajatis and Dalit households). Benefits were extended in terms of involvement in WUA orientation and training activities, and employment opportunities in the construction and agricultural sectors (ICR para.81). There was a zero-tolerance policy on child labor use as well as a high priority to health and safety standards for workers by promoting the use of protective equipment.

Involuntary Resettlement Safeguards. A Resettlement and Rehabilitation Policy Framework was prepared in the event that private property acquisition and/or appropriation for some sub-projects becomes inevitable or if project activities result in loss of privately-owned assets or displacement of people. During project implementation, no issues of land acquisition in the surface irrigation and groundwater rehabilitation sub-projects were reported. For the new groundwater sub-projects, a land contribution report was prepared following a voluntary donation approach from concerned water users (ICR para.81).

Projects on International Waterways Safeguards. Consistent with OP 7.50, an Exemption to Notification was obtained because the project only involved rehabilitation of existing small irrigation schemes.

Pest Management Safeguards. Guidelines for safe use of chemicals were prepared in the FFS curriculum for farmers, and training courses related to pesticides awareness, use and implications were included in the Social and Environment Management Plan (SEMP). These measures were considered adequate by the Bank in lieu of a pesticide management plan at the project level (AF2 Project Paper, para.20).

b. Fiduciary Compliance

Financial Management. In addition to initial difficulties in multi-agency coordination, multi-donor financing and internal communication, other challenges observed included the low disbursement of funds, transfer of finance staff, delay in the submission of tri-semester financial monitoring reports (FMRs), interim unaudited financial reports (IUFRs) and audit reports, and minor internal control weaknesses. Nonetheless, the financial management team including consultants were successful in resolving these issues and the financial management arrangement was assessed as satisfactory with no outstanding reports (FMRs/IUFRs) or audit reports. The auditor reports were all unqualified.

Procurement. The project procurement management was exemplary with satisfactory ratings for both implementing agencies (DoA and DoI).

c. Unintended impacts (Positive or Negative)

Fisheries. After rehabilitation works in groundwater sub-project areas, especially in the terai, fisheries have gained popularity among the farmers. The ICR (para.63) reported a 10% increase in dedicated areas for fish farming in Bhairahawa (Lumbini) with fish pond size ranging from 0.068 ha to 6 ha, accounting in total for 10% of the command area and generating a combined net income of around NPR 456 million. However, there is no evidence in the ICR on the data source.

General improvement in living conditions. Indicators noted in the ICR included the price increase in land and housing, and the return of inhabitants who previously out-migrated was observed in the project districts (ICR para.64).

d. Other

Gender. Although the gender-related indicators were not formally included in the Results Framework at appraisal, the inclusion of gender was encouraged from early stages of project planning with the preparation of a gender development strategy and a Gender Action Plan. The gender mainstreaming was reflected in continuous gender-disaggregated data collection and presentation of gender-related indicators in project progress reports. As a response to the Bank's agenda and the Government of Nepal effort to ensure gender equity in all aspects of project management, gender-specific outcome indicators were added during AF2. The ESMF prescribed mainstreaming of gender and Janajatis/Dalits development in sub-projects from the early stages of project planning and a Gender Action Plan was implemented at the scheme level as part of SEMP. The ICR (para.54-55) reported that the project extended the benefits to women, youth and vulnerable groups. Out of 384,361 water user beneficiaries under component A, the share of women, Janajatis, and Dalits were 51%, 18%, and 10%, respectively. A Gender and Vulnerable Community Development Action Plan (GVCDAP) was implemented as a pilot in groups comprising women and Janajatis/Dalit households in three sub-projects in the Western, Mid-Western and Far-Western regions. In addition, the project implemented the Youth Promotion Program which provided NPR 40,000 per entrepreneur for 747 young farmers, of which 47% were women. To support group mobilization and service extension, a total of 70 native social mobilizers were recruited, of which 54% were women and half of them belonged to the Janajatis and Dalits communities.

11. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Moderately Satisfactory	Satisfactory	This review rated outcome as satisfactory based on substantial ratings for relevance, efficacy and efficiency. On the other hand the ICR rated outcome moderately satisfactory because of the "partial

			achievement of the third objective" (ICR, paragraph 53), despite having also rated relevance, efficacy and efficiency as substantial.
Bank Performance	Moderately Satisfactory	Moderately Satisfactory	---
Quality of M&E	Substantial	Modest	Despite a clear M&E design at appraisal and a comprehensive Project Completion Report on the project's achievements prepared by OPD in the Ministry of Energy, Water Resources and Irrigation at closing, the lack of a coordinated and integrated approach to M&E weakened its implementation and utilization during the project's life.
Quality of ICR		Substantial	---

12. Lessons

IEG has drawn following lessons based on those in the ICR (p.29-30) with some changes in language:

Errors in cost assumptions at project preparation can lead to significant cost overruns, implementation delay, and subsequent reduction of the final project scope. In this project there was inadequate attention to the accuracy of unit construction costs and to realistic future inflation of costs over the project implementation period. These shortcomings resulted in the need for additional financing, delayed procurement and a reduced scope of the project.

To minimize implementation delay, terms of reference for technical studies require careful discussion and agreement among stakeholders during project preparation and appraisal. Initial delays in the development of the River Basin Management Plans in this project underlined the importance of finalizing terms of reference for technical studies at appraisal in order to have an agreed and precisely specified terms of reference for the consultancy services required and hence provide for an early start to the procurement of consultants to undertake the task.

The design of an integrated user-driven M&E system for a multi-agency project should be accompanied by a practical implementation plan. Despite strong coordination between DoI and DoA on the implementation of this project's activities, there were challenges to establishing, maintaining and utilizing the integrated M&E system as envisaged during appraisal. For projects that involve ministries or departments as

counterparts, an integrated M&E system that collects and evaluates critical information on a project's performance for a central database is a vital tool to monitor and assess a project's progress and achievements.

13. Assessment Recommended?

No

14. Comments on Quality of ICR

The ICR is logically written with sufficient information on the project overview, implementation, constraining factors, how the challenges were addressed, and results achieved. The ICR presents a clear rationale for the theory of change and how project activities were expected to contributed to the PDO. Apart from the ICR's determination of the overall outcome of the project in paragraph 53 of the ICR, the ICR structure and analysis follows the OPCS guidelines. It provides a candid and concise narrative to identify shortcomings of the project design, implementation and achievement, and explains reasons for significant changes during implementation including justification for delays. The analysis of issues in the efficiency section summarizes well the differences in methods and results over the project's evolution. The lessons are useful and based on evidence from the project's experience outlined in the ICR.

However, the ICR's description of project components is too short and consequently incomplete as the activities, expected outputs and changes in the project's scope and activities during the additional financings and restructurings are omitted. Although the presentation of achievements is based on data from all available sources, it lacked appropriate references to sources of data throughout the document, undermining the validity and reliability of evidence. The efficacy analysis mainly focuses on "before-after" the project rather than "with and without" the project, making the attribution of outcomes to project interventions questionable. In addition, considering frequent changes in the output and outcome indicators over the course of the project, it would have been useful had the ICR (a) discussed the achievement of project outputs/outcomes in both the original and restructured project scope, (b) assessed the indicators against the original and revised targets ("with and without"), (c) made use of the "with and without" the project data on yield and cropping intensity in Annex 4, and (d) indicated the implications of the addition or removal of indicators over time.

There are a number of internal inconsistencies in numbers, texts, and units of measurement between various sections of the ICR report. This internal inconsistency is particularly observed in the project costs, the efficacy and the efficiency section in relation to the information presented in the Annex and cross-referencing to other project documents. These include, for example, appraisal project costs between PAD Annex 5 and ICR Annex 3, actual project costs between ICR para.13-16 and ICR Annex 3, benefit cost ratios between ICR para.48 and ICR Table 4.6, economic net present value between ICR Table 4 and ICR Table 4.7, and

the entire ICR estimations of economic efficiency (ERR, BCR and ENPV) between ICR Table 4 and Table 4.13. At the request of IEG, the Bank task team kindly rectified these inconsistencies.

This review rates the quality of the ICR as Substantial, but with shortcomings.

a. Quality of ICR Rating
Substantial