Technical Assistance Report

PUBLIC

Project Number: 56218-002
December 2025

Nepal: Implementation Support for Irrigation Modernization Enhancement Project

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Asian Development Bank

CURRENCY EQUIVALENTS
(as of 16 November 2025)

Currency Unit	–	Nepalese rupee/s (NRe/NRs)
NRe1.00	=	$0.007042
$1.00	=	NRs142.00

ABBREVIATIONS

ADB	–	Asian Development Bank
DOA	–	Department of Agriculture
DWRI	–	Department of Water Resources and Irrigation
FMIS	–	farmer-managed irrigation system
HLIP	–	hill lift irrigation project
ISF	–	irrigation service fee
TA	–	technical assistance
WUA	–	water user association
WUC	–	water user cooperative

NOTES

(i) The fiscal year (FY) of the Government of Nepal ends on 16 July. “FY” before a calendar year denotes the year in which the fiscal year ends, e.g., FY2026 ends on 16 July 2025.

(ii) In this report, “$” refers to United States dollars.

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TECHNICAL ASSISTANCE AT A GLANCE

Project Data			
Project number	56218-002	**Project name**	Implementation Support for Irrigation Modernization Enhancement Project
Nature of Activity	✓Capacity Development	**Modality**	Stand-alone
Country	Nepal	**Executing or implementing agency**	Ministry of Energy, Water Resources and Irrigation
Department/Office	SD2/SD2-AFNR	**Geographical location**	Country
Sector(s)	✓ Agriculture, natural resources and rural development	**Subsector(s)**	Agricultural policy, institutional and capacity development Rural water policy, institutional and capacity development
Strategic Focus Area	✓ Resilience and empowerment Climate action	**Sustainable Development Goals**	SDG 2.c SDG 5.1, 5.b SDG 6.b

Financing

ADB Financing	**Amount** ($ million)
Technical Assistance Special Fund	0.75
Cofinancing	**Amount** ($ million)
None	0.00
Counterpart	**Amount** ($ million)
None	0.00
Total	**0.75**
ADB Climate Financing	
ADB	
Adaptation	0.70
Mitigation	0.05
Cofinancing (ADB-administered)	
Adaptation	0.00
Mitigation	0.00
Total	**0.75**

Currency of ADB Financing: US Dollar

Climate Action	
Disaster Risk Management, Environment and Nature	Not Applicable
Safeguards	
Category	Environment: ☐ A ☐ B ☐ C ☐ FI ☑ Not Applicable Involuntary resettlement: ☐ A ☐ B ☐ C ☐ FI ☑ Not Applicable Indigenous peoples: ☐ A ☐ B ☐ C ☐ FI ☑ Not Applicable
Gender Equality	
Category	☐ Gender equality objective (GEN) ☐ Effective gender mainstreaming (EGM) ☑ Some gender elements (SGE) ☐ Indirect gender benefits (IGB)
Poverty Reduction and Inclusion	
Category	☐ Poverty reduction and inclusion focus (PIF) ☐ Poverty reduction and inclusion elements (PIE) ☑ Indirect poverty reduction and inclusion (IPI)
Regional Cooperation and Public Goods	
Category	☐ Pillar 1 ☐ Pillar 2 ☐ Pillar 3 ☑ Not applicable

Source: Asian Development Bank

I. INTRODUCTION

1. The technical assistance (TA) will support the Department of Water Resources and Irrigation (DWRI) under the Ministry of Energy, Water Resources and Irrigation, and the Department of Agriculture (DOA) under the Ministry of Agriculture and Livestock Development to implement the Irrigation Modernization Enhancement Project (the project).[1] The TA will help address critical gaps in (i) institutional and technical capacity of the stakeholders, and (ii) development of sustainable agricultural value chains. Specifically the TA will focus on (i) improving governance of farmer-managed irrigation systems (FMISs) under Nepal's federal structure,[2] (ii) building technical capacity of the implementing agencies (the DWRI and the DOA), and (iii) enhancing climate-smart agricultural practices and market linkages. The TA will contribute to the sustainability of the project's infrastructure (covering about 33,000 hectares) by enhancing capacity of water user associations (WUAs) to effectively manage the irrigation systems and adopt resilient farming.

II. ISSUES

2. **Agriculture sector performance.** Nepal's agriculture sector actively drives the economy, contributing approximately 26.2% to the gross domestic product and employing 62.0% of households.[3] Despite this significance, the sector achieved stagnant average annual growth rate of 3.0% during 2015–2024, falling short of the 4.0% national target set in the Agriculture Development Strategy, 2015–2035. [4] Multiple issues hinder performance: (i) fragmented landholdings, (ii) high out-migration creating labor shortages, lack of reliable year-round irrigation, (iii) limited access to formal financial services, (iv) poor market and storage facilities, and (v) low technology adoption deterring investments in agricultural value addition.[5] It is estimated that 62% of farming households produce for their own consumption, with only 6% producing for the market (footnote 3). This deficit maintains malnutrition; 12.5% of the population experiences moderate to severe food insecurity, and 24.8% of children under the age of 5 suffer stunting.[6]

3. **Deficient irrigation service delivery.** Nepal's irrigation systems face significant challenges that underline agricultural productivity and climate resilience. FMISs, numbering about 15,000 and covering about 0.59 million hectares, form a crucial part of the cultivable land, yet these remote, scattered systems often lack suitable engineering designs and modern on-farm water management, making them highly dependent on seasonal river flows.[7] To provide reliable irrigation services to the many barren *tar* in the hill region that rely only on rainwater, authorities could utilize high-lift pumping from surface and subsurface sources powered by sustainable energy.[8] However, systematically adopting and scaling these hill lift irrigation projects (HLIPs) in dry *tar* requires a proven pathway for technical and financial sustainability.

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[1] Asian Development Bank (ADB). *Nepal: Irrigation Modernization Enhancement Project*.
[2] FMISs are small and medium-scale irrigation systems built, operated, and maintained by farmers themselves for decades or centuries with little help from the government.
[3] Government of Nepal, National Statistics Office. 2024. FY2024 National Accounts Statistics; and Government of Nepal, National Statistics Office. 2023. *National_Account_of_Nepal_2023-249_National_Report.pdf*
[4] Government of Nepal, Ministry of Agricultural Development. 2015. *Agriculture Development Strategy, 2015–2035*.
[5] ADB. 2025. *Country Partnership Strategy: Nepal, 2025–2029—A Partnership for Private Sector-Led Growth, Youth Employment, and Resilience*.
[6] Government of Nepal, Ministry of Health and Population, New ERA, and the Demographic and Health Surveys Program. 2023. *Nepal Demographic and Health Survey 2022*.
[7] Government of Nepal; Ministry of Energy, Water Resources and Irrigation; DWRI. 2019. *Irrigation Master Plan 2019 (updated 2024)*.
[8] *Tar* is a Nepali word used to describe an ancient alluvial fan formed into a flat basin used as agricultural land.

4. **Climate risks.** Climate change threatens Nepal's irrigation water availability, accessibility, and scalability. The country faces more frequent and intense extreme weather events, including prolonged droughts and flash floods, which alter precipitation patterns. Future projections predict greater monsoon rainfall variability and rapid glacial melting, increasing both water scarcity and flood risks. These climate change impacts pose significant challenges to water resources and livelihoods across the country.[9] They also force greater reliance on groundwater for irrigation, particularly in the Terai region, but increasing extraction endangers its long-term sustainability.[10] Critically, Nepal's 1990 national manual for irrigation design is obsolete and fails to account for climate and disaster risks, preventing the construction of resilient infrastructure.[11] The agriculture sector and the irrigation subsector urgently needs interventions to improve climate and disaster resilience, enhance water use efficiency, promote climate-smart agriculture and digitalization, strengthen water governance, and build institutional capacity.[12] The unreliable irrigation and lack of novel techniques also limit farmers' ability to diversify into high-value crops, posing further risks to national water and food security.[13]

5. **Weak capacity in irrigated agriculture services.** While WUAs and water user cooperatives (WUCs) improve management, they still lack the resources and expertise needed to effectively operate and maintain irrigation systems.[14] Failure to fully integrate irrigation and agricultural functions, as outlined in the national plan: Irrigation Master Plan (footnote 7) and Agriculture Development Strategy (footnote 4), further impedes agriculture productivity. Legal and policy impediments hinder full cost recovery through the irrigation service fee (ISF), compromising sustainability; annual collection (about $10 per hectare) falls far short of the estimated operation and maintenance cost (about $50 per hectare) due to a lack of legal empowerment for WUAs to enforce collection and nonstandardized fee structures (footnote 1). Fragmented farms limit farmers' collective bargaining power for inputs, marketing, and credit. Farmers also lack access to crucial information on weather, markets, and crop technology, resulting in inefficient agricultural planning. Although the Local Government Operation Act, 2017 gives local agencies greater responsibility for irrigated agriculture, a shortage of skilled human resources, like agricultural extension agents, prevents these agencies from effectively assisting farmers.[15]

6. **Proposed assistance.** The Irrigation Modernization Enhancement Project directly addresses irrigation challenges by modernizing and rehabilitating existing systems and developing new high-lift infrastructure, providing essential physical investments to expand irrigated land and improve water delivery efficiency. The TA will complement these efforts by strengthening institutional capacity, governance, and long-term sustainability. Specifically, the TA will strengthen WUAs and WUCs, develop a long-term strategy for sustainability of FMISs, build capacity in the implementing agencies for standardized HLIP designs for scale-up, provide

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[9] International Federation of Red Cross and Red Crescent Societies. 2021. *Climate Change Impacts on Health and Livelihoods: Nepal Assessment*.

[10] The Terai region refers to the southern plains across the length of Nepal up to an altitude of 300 meters.

[11] Government of Nepal and United Nations Development Programme. 1990. *Planning and Design Strengthening Project*.

[12] R. C. Khanal and P. Pradhan. 2021. Approach Towards Building Climate-Resilient Irrigation Systems for Food Security in Nepal. In V. P. Pandey, S. Shrestha, and D. Wiberg, eds. *Water, Climate Change and Sustainability*. Wiley. pp. 225–238.

[13] High-value crops are agricultural products, such as fruits, vegetables, flowers, spices, and medicinal and aromatic plants, that generate a higher net financial return per unit of land compared to staple crops.

[14] The WUAs are registered in water resources irrigation development divisions as community-based organization for operation and maintenance of systems and raise irrigation service fee based on Irrigation Policy 2013, whereas WUCs will be registered in the local bodies as commercial entity following Nepal Cooperative Act 2017.

[15] The Local Government Operation Act, 2018 lays down the legal foundation for legislative, executive, and quasi-judiciary practices of local governments in Nepal. The act finds its basis in the Constitution of Nepal, 2015.

technical support for mechanization and modernization, and initiate climate-smart agricultural value chains and market linkages.

7. **Strategic alignment.** The project and the TA align with Nepal's national water resources, irrigation, and agriculture plans and priorities, including the (i) National Water Plan Nepal, 2002–2027, which aims at increasing water use efficiency to provide year-round irrigation through modernization of FMISs; (ii) Agriculture Development Strategy, 2015–2035, which promotes acceleration of agricultural intensification and diversification into high-value crops to achieve Nepal's overarching goal of economic growth and poverty reduction (footnote 4); (iii) National Water Resources Policy 2021, which promotes year-round irrigation, lifting of water to irrigate *tars* and institutional strengthening; and (iv) The Sixteenth Plan (Fiscal Year 2024/25–2028/29, which prioritizes emphasizing year-round irrigation, modernization and commercialization of the agriculture sector, and climate adaptation strategies, particularly to increase access to climate-smart agriculture technologies by smallholder farmers.[16] The TA is also aligned with the country partnership strategy for Nepal, 2025–2029 of the Asian Development Bank (ADB), particularly contributing to strategic priority 1 on increasing productivity, sustainability, and resilience of agriculture and natural resources (footnote 5). Additionally, the TA is also strategically aligned with operational approach for food systems transformation in Asia and the Pacific (2026–2030) on (i) strengthening agrifood value chains and (ii) upgrading infrastructure for resilient food systems.[17] The TA is also aligned with the new strategic focus areas identified in ADB's Strategy 2030 midterm review on (i) climate action and (ii) resilience and empowerment.[18]

III. THE TECHNICAL ASSISTANCE

A. Impact and Outcome

8. The TA will (i) strengthen the institutional and financial sustainability of FMISs and WUAs through policy development and capacity building; (ii) enhance technical and operational standards for FMISs; and (iii) support climate-smart agricultural value chain development by connecting farmers with markets, providing technical training and digital advisory services, and establishing innovative financing partnerships. The TA will empower women and disadvantaged groups and promote advanced technologies to improve agricultural community resilience to climate change.

9. The TA's impact will be climate resilience and livelihoods of farming households enhanced. To sustain modernized irrigation systems and accelerate agricultural productivity, the TA's outcome will be strategic policy, institutional capacity, and financial pathways established.[19]

B. Outputs, Methods, and Activities

10. **Output 1: Institutional sustainability of FMISs strengthened.** The TA will support the development of a long-term strategy for investment and financially sustainable management of FMISs and WUAs in Nepal. This strategy will establish concrete policy measures and financial

[16] Government of Nepal, Water and Energy Commission Secretariat. 2005. *National Water Plan Nepal, 2002–2027*; Government of Nepal; Ministry of Energy, Water Resources and Irrigation. 2021. *National Water Resources Policy, 2077*; and Government of Nepal, National Planning Commission. 2024. *The Sixteenth Plan (Fiscal Year 2024/25–2028/29)*.

[17] ADB. 2025. *Investing in Nature, Building Water and Food Resilience, and Revitalizing Rural Economies, Operational Approach for Food Systems Transformation in Asia and the Pacific (2026–2030).*

[18] ADB. 2024. *Strategy 2030 Midterm Review: An Evolution Approach for the Asian Development Bank*.

[19] The design and monitoring framework is in the Appendix.

models to close the persistent ISF collection gap (from past projects) by introducing a mechanism for stakeholder operation and maintenance contributions and securing federal and/or provincial assurance for adequate future operation and maintenance funding.[20] Additionally, the TA builds capacity in the implementing agencies and provincial governments to adopt modern, financially sound, and inclusive irrigation strategies, including integrating social and environmental safeguards into governance. It delivers targeted training on climate-resilient design, integrated crop water management, and performance monitoring. Crucially, the capacity building supports WUAs to transition into business-like WUCs with agribusiness functions, directly linking water management to agricultural profitability and incentivizing sustainable fee collection. Key activities under this output will include the following: (i) review Nepal's irrigation system field design manual and standard structure design manual to identify gaps and provide recommendations for necessary updates; (ii) develop guideline for institutional governance of water uses for FMISs and HLIPs; (iii) review the existing ISF collection practice, and develop and orient financial modules (including ISF collection models) for the use of WUAs and/or WUCs; and (iv) support the project team through consultation meetings to help achieve compliance with the social and environmental safeguards and to help mainstream the gender equality and social inclusion action plan.

11. **Output 2: Technical capacity of the implementing agencies enhanced.** The TA will strengthen the technical capacity of the implementing agencies by analyzing the performance of irrigation schemes (including HLIP pilots) and transferring knowledge and skills in electromechanical, hydromechanical, and agri-mechanical aspects for the effective operation, management, and maintenance of the project's technical components. Key activities under this output will include (i) providing technical support to design and operate the electromechanical, hydromechanical, and agri-mechanical parts to enhance system performance; (ii) conducting financial viability assessments along with environmental and social safeguards due diligence of the multiple components; and (iii) producing technical guidelines for operation, management, and maintenance of the technical inputs (electrotechnical, hydromechanical, and agri-mechanical) provided by the project (with specifications and renewable energy solutions), and specialized training for the project team, technicians, and WUAs and/or WUCs.

12. **Output 3: Climate-smart agricultural value chain development supported.** The TA will create opportunities for the linkage of farmers supported by irrigation modernization with agricultural markets by strengthening related agencies and the capabilities of WUAs and/or WUCs in climate-smart production and agri-business management. Key activities under this output will include (i) supporting the Irrigation Modernization Enhancement Project to identify and capacitate farmers, including Indigenous Peoples communities, on innovative, climate-resilient agriculture practices through expert technical guidance; (ii) building capacity and facilitating market linkages and value addition strategies, with a specific focus on empowering women-led institutions, and providing technical training on production, post-harvest management, and marketing; and (iii) supporting implementing agencies in identifying the specific needs of farming communities, including Indigenous Peoples communities, to enhance existing digital advisory services that help farmer decision-making. The TA will support this output in prioritizing innovation and further development of similar digital services, bridging the current gaps and encouraging emerging technologies (e.g., farm decision-making powered by artificial intelligence, real-time support) tailored to the local context. The TA will also provide a mentorship program to help develop the

[20] ADB. *Nepal: Community Irrigation Project* (2010) covered small-scale FMISs in Karnali, Lumbini, and Sudurpashchim provinces. (i) ADB. Nepal: Irrigation Sector Project (1988); (ii) ADB. *Nepal: Second Irrigation Sector Project* (1996); (iii) ADB. Nepal: Community-Managed Irrigated Agriculture Sector Project (2004); and (iv) ADB. 2014. *Report and Recommendation of the President to the Board of Directors: Proposed Loan for Additional Financing to Nepal for the Community-Managed Irrigated Agriculture Sector Project* supported six medium-scale FMISs in Bagmati, Gandaki, Karnali, Koshi, Lumbini, Madhesh, and Sudurpashchim provinces.

agribusiness value chain by incorporating climate-resilient practices, supporting the creation of innovative, climate-smart financing mechanisms (e.g., bundled loans) in partnership with banks and insurance providers. These interventions will help establish sustainable partnership models between WUAs, financial institutions, and private sector actors.

13. **Innovation, lessons, and ADB's value addition.** The TA addresses key areas identified in previous projects by prioritizing social inclusion, strengthening the capacity of women and disadvantaged groups, ensuring their equal representation in WUAs, and including landless and Indigenous Peoples farmers. The TA will institutionalize design norms and standards for HLIPs and by introducing innovative approaches to address low agricultural productivity and climate change risks. It promotes renewable energy solutions for HLIPs and supports the digitalization of farmer decision-making. It will empower farmer organizations, including those women; support agri-enterprise development; and improve access to markets and finance. Building on lessons learned from past projects, the TA will focus on sustainability and promote climate-smart agriculture technologies to increase farmer income and, in turn, their capacity and willingness to pay ISFs. Crucially, the TA will engage with the DWRI, DOA, and relevant government agencies and stakeholders to develop a strategic road map, policy pathways, and implementation pathways to address existing legal impediment to full cost recovery.

C. Cost and Financing

14. The TA financing amount is $750,000, which will be financed on a grant basis by ADB's Technical Assistance Special Fund: (i) $392,000 from Technical Assistance Special Fund (TASF 8); (ii) $298,928 from Savings and Cancellations of Technical Assistance Special Fund (S&C:TASF 6); and (iii) $59,072 from Savings and Cancellations of Technical Assistance Special Fund (S&C:TASF 7). The government will provide counterpart support in the form of counterpart staff, office facilities for individual consultants, and other in-kind contributions. The key expenditure items are listed in Annex 1. The TA funding will not be used for (i) civil work, (ii) the procurement of large-scale equipment or vehicles, or (iii) permanent staffing costs.

15. The total TA amount is broken down per output in Table 1.

Table 1: Cost Breakdown per Output

Output	Indicative Costs ($)	TA Amount (%)
Output 1: Institutional sustainability of FMISs strengthened	194,171	25.89
Output 2: Technical capacity of the implementing agencies enhanced	322,080	42.94
Output 3: Climate-smart agricultural value chain development supported	233,749	31.17
Total	**750,000**	**100.00**

FMIS = farmer-managed irrigation system, TA = technical assistance.
Source: Asian Development Bank estimates.

D. Implementation Arrangements

16. The Ministry of Energy, Water Resources and Irrigation will be the executing agency responsible for the strategic direction for the implementation of the TA. The DWRI and DOA will be the implementing agencies and will closely coordinate with ADB on the needs identification

and implementation support required from the TA.[21] ADB will administer the TA, including selecting, recruiting, supervising, and evaluating consultants throughout the TA implementation.

17. Implementation arrangements are summarized in Table 2.

Table 2: Implementation Arrangements

Aspects	Arrangements		
Indicative implementation period[a]	January 2026–December 2030		
Executing agency	Ministry of Energy, Water Resources and Irrigation		
Implementing agencies	Department of Water Resources and Irrigation and Department of Agriculture		
Consultants	ADB will administer the TA and will be responsible for selecting, supervising, and evaluating consultants.		
	Firm: QCBS (90:10) or SCQS	National expertise (62 person-months)	$369,085
	Individual: individual consultant selection	International expertise (3 person-months) National expertise (38 person-months)	$380,915
Disbursement	Disbursement of TA resources will follow ADB's *Technical Assistance Disbursement Handbook* (2020, as amended from time to time).		

ADB = Asian Development Bank, QCBS = quality- and cost-based selection, SCQS = simplified consultants' qualifications selection, TA = technical assistance.
[a] The implementation period starts from the expected month of commitment or signing.
Source: ADB estimates.

18. **Consulting services.** ADB will engage consultants following the ADB Procurement Policy (2017, as amended from time to time). The consulting firm will be selected using quality- and cost-based selection, with a quality–cost ratio of 90:10 or a simplified consultants' qualification selection. Individual consultants and/or resource persons will be recruited through competitive or direct selection (as appropriate) and processed through ADB's Consultant Management System to provide international and national consulting inputs. ADB will disburse funds in line with the *Technical Assistance Disbursement Handbook* (2020, as amended from time to time).

IV. THE PRESIDENT'S DECISION

19. The President, acting under the authority delegated by the Board, has approved the provision of technical assistance not exceeding the equivalent of $750,000 on a grant basis to the Government of Nepal for Implementation Support for Irrigation Modernization Enhancement Project, and hereby reports this action to the Board.

[21] The DWRI will be responsible for implementing output 1 and output 2 (irrigation related) of the TA. The DOA will be responsible for implementing output 3 and output 2 (agriculture related) of the TA.

DESIGN AND MONITORING FRAMEWORK

Impact the TA is Aligned with Climate resilience and livelihoods of farming households enhanced (National Adaptation Plan 2021-2050)[a]			
Results Chain	**Performance Indicators**	**Data Sources and Reporting Mechanisms**	**Risks and Critical Assumptions**
Outcome Strategic policy, institutional capacity, and financial pathways established	By 2030: a. ISF policy for FMIS officially endorsed. (2025 baseline: not applicable). b. Design manuals for irrigation systems amended. (2025 baseline: not applicable).	a. Project progress reports b. TA progress reports	A: Commitment of the government to institutional reforms are sustained. R: Political changes disrupts collaboration and coordination among different government agencies and three tiers of government
Outputs 1. Institutional sustainability of FMISs strengthened	1a. Institutional governance guidelines for WUAs and/or WUCs on water-use management developed and officially endorsed by 2028 (2025 baseline: not applicable) 1b. At least 70% of relevant project staff (of which at least 10% are women) reported increased understanding of institutional governance for water use (2025 baseline: not applicable) 1c. Financial models including an ISF collection model for WUAs and/or WUCs, developed (2025 baseline: not applicable) 1d. At least 70% of relevant project staff (of which at least 10% are women) reported increased understanding of WUA financial management and ISF collection models (2025 baseline: not applicable) 1e. Gap analysis and recommendation for updating irrigation design manuals submitted. (2025 baseline: not applicable).	1a. Developed documents, manuals and guidelines. 1b. Event Reports 1c. Event's pre and post tests 1d. TA progress reports 1e. ADB, TA review mission reports	A: High willingness of beneficiaries to adopt new knowledge. R: Consultants selected to provide capacity building have weak capacity

Results Chain	Performance Indicators	Data Sources and Reporting Mechanisms	Risks and Critical Assumptions
2. Technical Capacity of the Implementing Agencies Enhanced	2a. O&M manuals for electromechanical, hydromechanical and agri-mechanical systems of the FMISs and/or HLIPs developed (2025 baseline: not applicable)	2a. Developed manuals	A: Capacity building programs are aligned to the needs of the target beneficiaries
	2b. At least 70% of relevant project staff reported increased understanding of O&M of electromechanical, hydromechanical, and agri-mechanical systems of the irrigation modernization (2025 baseline: not applicable)	2b. Event reports	R: Consultants selected to provide capacity building have weak capacity
	2c. Participating project team members (including 20% women team members) on (national and international) exposure visits reported enhanced (knowledge and understanding) of irrigation and agriculture modernization (2025 baseline: not applicable)	2c. Exposure visit reports	
3. Climate-smart agricultural value chain development supported	3a. Technical guidelines for adaptation of climate-resilient agriculture practices developed and officially endorsed by 2028 (2025 baseline: not applicable)	3a. Developed guidelines	A: Farmers identify comparative advantages in production to access markets
	3b. At least 70% of relevant project staff (including at least 10% women staff) trained reported increased knowledge on climate-resilient agriculture practices (2025 baseline: not applicable)	3b. TA progress reports	R: Climate change impacts are greater than predicted
	3c. At least 80% of the 100 WUAs and WUCs members (with at least 30% women participants) reported increased knowledge on climate-resilient agriculture practices (2025 baseline: not applicable)	3c. Event's pre and post tests	
	3d. Entrepreneurship and marketing capacity-building manual for WUAs and/or WUCs developed (2025 baseline: not applicable)	3d. Developed manuals	
	3e. At least 80% of the 100 WUAs/WUCs members enrolled in the mentorship program (with at least 30% women) reported increased knowledge on	3e. Event reports	

Results Chain	Performance Indicators	Data Sources and Reporting Mechanisms	Risks and Critical Assumptions
	entrepreneurship and marketing (2025 baseline: not applicable) 3f. WUCs manual for business plan development produced (2025 baseline: not applicable) 3g. Review report (brief) on the existing digital agri-advisory system with recommendations for improvement prepared and submitted to the CAMO (2025 baseline: not applicable)	3f. Developed manual 3g. Developed brief	

Key Activities with Milestones

1. Institutional sustainability of FMISs strengthened
   - 1.1 Review Nepal's irrigation system design manuals (field and standard structure) and provide recommendations for necessary updates (Q3 2026–Q2 2027)
   - 1.2 Develop guidelines on institutional governance for WUAs and/or WUCs on water use management (Q3 2026–Q2 2027)
   - 1.3 Provide three events of capacity-building training at the provincial level on institutional governance for water use management to the project team (CPMO or PIUs or Rajapur Irrigation Project) (Q3 2026–Q2 2028)
   - 1.4 Review existing practice of WUAs' and/or WUCs' financial management and ISF collection and find out the bottleneck for ISF-related issues (Q3 2026–Q2 2027)
   - 1.5 Develop financial models including ISF collection models for WUAs and/or WUCs (Q1–Q4 2027)
   - 1.6 Provide three capacity-building trainings at the provincial level on WUAs' and/or WUCs' financial management and ISF collection to the project team (CPMO and/or PIUs and/or RIP) (Q4 2026–Q4 2027)
   - 1.7 Conduct a consultation meeting for the implementation of the social and environmental safeguard measures of the project (Q3 2026–Q2 2028)
   - 1.8 Conduct a consultation meeting to familiarize the project team with planning and implementing the gender equality and social inclusion target (Q3 2026–Q2 2028)

2. Technical **c**apacity of the implementing agencies enhanced
   - 2.1 Review the HLIPs' design and electromechanical and hydromechanical components and develop O&M manuals for electromechanical and hydromechanical parts (Q3 2026–Q4 2027)
   - 2.2 Provide capacity-building trainings (one at DWRI and CPMO) on O&M manuals for electromechanical and hydromechanical of the HLIPs to the project team (Q3 2027–Q2 2028)
   - 2.3 Review the requirements of the agri-mechanical systems supported to the WUAs and/or WUCs and develop prototype manuals for the major agri-mechanical systems (Q3 2026–Q2 2028)
   - 2.4 Provide three capacity-building training to the project team (CAMO, provincial ministry, AKC, local- agri-mechanical systems (Q3 2027–Q2 2028)
   - 2.5 Conduct a study visit, locally or internationally, to increase participants' knowledge of good practices in project implementation and monitoring and evaluation of irrigation modernization and climate-resilient agriculture interventions (Q2 2026, Q3 2030)

3. Climate-smart agricultural value chain development supported
   - 3.1 Review the present practice of farming and develop a technical guideline for adaptation of the climate-resilient agriculture practices. Provide five capacity-building trainings for WUAs and/or WUCs to pilot the guideline and disseminate the knowledge on adaptation of climate-resilient agriculture practices on production, plant protection, and post-harvest handling (Q3 2026, Q3 2028)
   - 3.2 Conduct a comparative study on the effectiveness of establishing farmers' market linkages between agricultural cooperatives and private entrepreneurs for sustainability in the long term (Q3 2026, Q3 2027)
   - 3.3 Develop entrepreneurship and marketing capacity-building materials for WUAs and/or WUCs and pilot the developed materials by conducting five trainings for WUAs and/or WUCs (30% women's participation) (Q1 2027, Q3 2028)
   - 3.4 Develop business plan development manuals for WUCs and pilot developed manuals for WUAs and/or WUCs (Q3 2027, Q4 2028)
   - 3.5 Conduct regular business mentoring activities for the WUAs and/or WUCs Q3 2026, Q4 2030)

3.6 Conduct consultation meetings to discuss the findings of the review report on the existing digital advisory service and make recommendations on the development of the farmer-friendly artificial intelligence-assisted digital service for climate-resilient agriculture practices (Q3 2026, Q4 2027) **TA Management Activities** Recruit and mobilize consultants (Q1 2025–Q4 2030) Conduct TA review missions (Q2 and Q4 2026–2030 with the Irrigation Modernization Enhancement Project review mission) Report, monitor, and evaluate TA activities and outputs (Q1 2026–Q4 2030)
Inputs Asian Development Bank: $392,000 from Technical Assistance Special Fund (TASF 8) $298,928 from Savings and Cancellations of Technical Assistance Special Fund (S&C:TASF 6) $59,072 from Savings and Cancellations of Technical Assistance Special Fund (S&C:TASF 7) Note: The government will provide counterpart support in the form of counterpart staff, office accommodation and workshop and training facilities, project-related information, and other in-kind contributions.

A = assumption, ADB = Asian Development Bank, AKC= agriculture knowledge center, CAMO = central agriculture management office, CPMO = central project management office, DWRI= Department of Water Resources and Irrigation, FMIS = farmer-managed irrigation system, HLIP = Hill Lift Irrigation Project, ISF = irrigation service fee, O&M = operation and maintenance, PIU = project implementation unit, Q = quarter, R = risk, RIP= Rajapur Irrigation Project, S&C= saving and cancellation, TA = technical assistance, WUA = water user association, WUC = water user cooperative.

[a] Government of Nepal. 2021. *National Adaptation Plan (NAP) 2021–2050.*

Source: Asian Development Bank.