Technical Assistance Report

Project Number: 51159-001
Transaction Technical Assistance (TRTA)
July 2017

Cambodia: Irrigated Agriculture Improvement Project Cofinanced by Project Readiness Improvement Trust Fund

Asian Development Bank

CURRENCY EQUIVALENTS
(as of 1 July 2017)

Currency unit	–	riel (KR)
KR1.00	=	$0.000245
$1.00	=	KR4,089.00

ABBREVIATIONS

ADB	–	Asian Development Bank
FWUC	–	farmer water user communities
MOWRAM	–	Ministry of Water Resources and Meteorology
NWDMC	–	national water data management center
O&M	–	operation and maintenance
SDP-WRP	–	Strategic Development Plan on Water Resources and Meteorology
TRTA	–	transaction technical assistance

NOTE

In this report, "$" refers to US dollars.

Vice-President	S. Groff, Operations 2
Director General	R. Subramaniam, Southeast Asia Department (SERD)
Directors	J. Zhang, Environment, Natural Resources and Agriculture Division, SERD S. Tukuafu, Cambodia Resident Mission
Team leader	R. Farrukh, Water Resources Specialist, SERD
Team members	O. Goh-Livorness, Counsel, Office of the General Counsel K. Koiso, Procurement Specialist, Operations Services and Financial Management Department L. Leung, Natural Resources and Agriculture Economist, SERD L. Levaque, Social Development Specialist, SERD P. Long, Senior Project Officer, SERD H. Matsuda, Water Resources Specialist, SERD G. O'Farrell, Environment Specialist (Safeguards), SERD
Peer reviewer	A. Tayyab, Principal Natural Resources and Agriculture Economist, Central West Asia Department

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TRANSACTION TECHNICAL ASSISTANCE AT A GLANCE

1. Basic Data — **Project Number:** 51159-001

Project Name	Irrigated Agriculture Improvement Project	**Department /Division**	SERD/SEER
Nature of Activity	Project Preparation	**Executing Agency**	Ministry of Water Resources and Meteorology
Modality	Regular		
Country	Cambodia		

2. Sector

	Sector	Subsector(s)	Financing ($ million)
✓	Agriculture, natural resources and rural development	Irrigation	2.50
		Total	**2.50**

3. Strategic Agenda

Strategic Agenda	Subcomponents	Climate Change Information	
Inclusive economic growth (IEG)	Pillar 2: Access to economic opportunities, including jobs, made more inclusive	Climate Change impact on the Project	Medium

4. Drivers of Change

Drivers of Change	Components	Gender Equity and Mainstreaming	
Governance and capacity development (GCD)	Institutional development	Effective gender mainstreaming (EGM)	✓
Knowledge solutions (KNS)	Knowledge sharing activities		
Partnerships (PAR)	Bilateral institutions (not client government) Implementation		

5. Poverty and SDG Targeting

Geographic Targeting	No
Household Targeting	No
SDG Targeting	Yes
SDG Goals	SDG2, SDG13

Location Impact

Rural	High

6. Risk Categorization Low

7. Safeguard Categorization Safeguard Policy Statement does not apply

8. Financing

Modality and Sources	Amount ($ million)
ADB	**2.00**
Transaction technical assistance: Technical Assistance Special Fund	2.00
Cofinancing	**0.50**
Project Readiness Improvement Trust Fund	0.50
Counterpart	**0.00**
None	0.00
Total	**2.50**

I. THE ENSUING PROJECT

1. The ensuing project will contribute to achieving targets defined in the National Strategic Development Plan that is derived from the government's rectangular strategy.[1] The strategy aims to develop and expand the country's irrigated land and manage its water resources more effectively by improving existing irrigation systems, making water user communities more efficient, building capacity of the water users, and reducing the vulnerability of the Cambodia's people to climate induced disasters. The Irrigated Agriculture Improvement Project will also incorporate findings and recommendations of Asian Development Bank (ADB) sector strategy including (i) enhancing agriculture productivity, (ii) promoting diversification, (iii) environmental sustainability and climate change, (iv) gender development, and (v) addressing institutional constraints. The project is consistent with two of the major strategic thrusts and components of the Country Partnership Strategy, 2014-2018 i.e. agriculture and physical infrastructure.[2] It also conforms to ADB's Water Operational Plan and Irrigation Subsector Guidance Note 2017 that focus on increasing irrigation efficiency[3] and water productivity;[4] and Agriculture and Natural Resources Operational Plan that focuses on increasing agricultural productivity and improved management of natural resources.

2. ADB has pioneered approaches to mainstream irrigation efficiency and water productivity management options in the project design, and introduced a new model for sustainable management of irrigation systems by integrating modernization, upgrading and climate proofing under Uplands Irrigation and Water Resources Management Sector Project,[5] that is being implemented successfully. It is worth mentioning that no other project in Cambodia financed by any donor has introduced such approaches. Building upon those approaches, the project will deliver the following two outputs to address the key issues and constraints in sustainable management of irrigation and water resources.

3. **Output 1: Efficiency and climate resilience of irrigation systems enhanced.** The project will upgrade, modernize and climate proof irrigation infrastructure and their management including reservoirs and canals in at least five irrigation systems ensuring dry season irrigation supplies for about 40,000 ha agricultural land. The project will finance remodeling and improvement of main, secondary and tertiary canals as well as appurtenant structures designed to supply water as per seasonal crop water requirements. Cropping patterns will be designed for each canal command area to estimate the crop water requirements that will ascertain the design capacity of canals and maximize cropping intensities. For crop diversification, demand analysis will be done to determine cropping pattern in each canal command based on the market response and other relevant factors. Land drainage and flood management facilities will be provided, where

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[1] Government of Cambodia. 2013. *Rectangular Strategy for Growth, Employment, Equity, and Efficiency, Phase III.* Phnom Penh. The document presents the 5-year policy agenda of the government and forms the basis of the National Strategic Development Plan, 2014–2018.

[2] ADB. 2014. *Country Partnership Strategy: Cambodia,* 2014-2018. Manila.

[3] There is no evidence of measuring irrigation efficiency and data on that in Cambodia. ADB, for the first time, measured irrigation efficiency in three canal systems during preparation of the Uplands Irrigation and Water Resources Management Sector Project in 2015. A baseline of 20% was established on that basis. Same approach will be adopted to establish baseline for the selected irrigation systems during project preparation.

[4] There is no data available on water productivity in Cambodia. ADB developed an approach to estimate that during preparation of Uplands Irrigation and Water Resources Project in 2015 and estimated water productivity of rice, cassava, corn, water melon, pineapple and mung bean in three canal commands. Results showed that rice and cassava have the lowest water productivity, $0.1 and $0.08 respectively; water melon has highest $0.35; and mung bean, corn and pineapple corn have $0.19, $0.18 and $0.17 per cubic meter of water respectively. The project will adopt same approach for establishing baseline and targets for the selected irrigation systems.

[5] ADB. 2015. *Report and Recommendation of the President to the Board of Directors; Proposed Loan to the Government of Cambodia for Uplands Irrigation and Water Resources Management Sector Project*. Manila.

required. Irrigation systems will be designed to double the existing irrigation efficiency.[6] At least five farmer water user communities (FWUCs) will be established/operationalized and trained to assume responsibility of operation and maintenance (O&M) of the distribution canals. An irrigation asset management system will be established to help improve O&M budgeting and management of irrigation assets in the country. That will be based on the Cambodia Irrigation Schemes Information System, which provides basic data on the canal condition, service area, beneficiaries etc. For main canals, O&M plans will be prepared for each canal during design. The project will modernize canal operations, undertake irrigation scheduling, and integrate the scheduling with the canal flow management system to manage supplies, particularly during droughts. It will also design joint reservoir operations for improving water-sharing arrangements between linked systems and ensure equitable distribution, particularly during droughts.

4. **Output 2: Water resource management improved.** The project will provide gender-inclusive training to FWUC members on (i) O&M of canals; (ii) governance and management of FWUCs; (iii) crop diversification; and (iv) water management. FWUCs will also be involved in implementation of the subprojects. Water flow gauges will be installed in canals to establish canal flow management system. Hydro-meteorological stations will be installed in the watersheds to collect real-time river flow and climatic data. The project will train staff of the relevant government departments and FWUCs on (i) modern canal operation techniques; (ii) irrigation scheduling; (iii) water management; and (iv) O&M. A water management information system (WMIS) will be developed as a common platform for country-wide data of river flows and rainfall. That will also incorporate data generated by water accounting through remote sensing. WMIS will be housed in national water data management center (NWDMC) that will be established by the project. NWDMC will be the hub for water related information/data in the country and shall be responsible for collecting, analyzing and disseminating information/data.

5. The above outputs will result in the following outcome: water and agricultural productivity enhanced. The impact will be inclusive economic growth through agriculture and irrigation aligned with National Strategic Development Plan and Rectangular Strategy on Growth, Employment, Equity and Efficiency, Phase III, 2014 to 2018.

6. The project area, expected to be three to four provinces, will be selected out of seven provinces including Battambang, Kampot, Kampong Cham, Kampong Thom, Prey Veng, Takeo, and Tbong Khmum by the transaction technical assistance (TRTA) consultants on the basis of a selection criteria. These provinces have great potential to increase agriculture production by 2 to 3 times as well as crop diversification towards enhanced food security of the country.[7] This will also allow complementing the impact and outcome of the Climate Resilient Rice Commercialization Development Program (Rice-SDP)[8] approved in 2013, and the proposed Climate-Friendly Agribusiness Value Chains Sector Project scheduled for approval in 2018, that are covering these seven provinces. The project will ensure convergence so agriculture value chain facilities provided under those two projects will enhance economic value of the increased agricultural production brought by the project, resulting in higher incomes of the farmers, reduction in imports of fruits and vegetables, and greater economic returns to the country.

7. The project cost is tentatively estimated at $82.0 million with ADB COL of $75.0 million

[6] Irrigation efficiency is the ratio of water consumed by crops to water diverted into a canal system.

[7] Wet season rice is the main crop due to unavailability of water in dry season. The ensuing project will provide water in dry season making it possible to grow two additional crops: (i) mix of dry season rice and fruits/vegetables, and (ii) only fruits/vegetables such as water melon, pineapple, mung bean etc.

[8] ADB. 2013. *Report and Recommendation to the President to the Board of Directors for Cambodia: Proposed Loans and Administration of Grants and Loan to Kingdom of Cambodia for Climate-Resilient Rice Commercialization Sector Development Program*. Manila.

and $7.0 million counterpart financing by the Government. The ensuing loan and this transaction TA is listed in the Country Operations Business Plan, Cambodia, 2017-2019.

II. THE TECHNICAL ASSISTANCE

A. Justification

8. The transaction technical assistance (TRTA) is necessary to (i) carry out the feasibility study; (ii) prepare design of the project; (iii) complete detailed engineering design of subprojects and prepare bidding documents; and (iv) undertake due diligence of technical, social, financial, environmental, gender, and economic aspects of the project. As result, the ensuing loan will be classified as "high readiness".

B. Outputs and Activities

9. **Output 1: Feasibility study on ensuing project completed.** Technical, financial, economic, social, environmental viability of the project will be assessed. Climate risk assessment, gender assessment, and procurement risk assessment will be carried out. A feasibility study report will be prepared. The international and national experts will be recruited under the TRTA to carry out the feasibility study. Feasibility study report will be submitted by the TRTA consultants to ADB and the government as part of the technical assistance report.

10. **Output 2: Design of ensuing project prepared.** The TRTA will (i) determine scope, components, and geographical coverage of the project; (ii) identify and prepare subprojects; (iii) prepare procurement plan; prepare resettlement plans of subprojects; (iv) conduct initial environmental examination studies of subprojects and prepare initial environmental examination reports; (v) prepare gender action plan; (vi) design implementation arrangements; (vii) develop framework and recommendations for establishing irrigation asset management system; (viii) develop framework and guidelines for developing water management information system and establishing NWDMC; (ix) prepare terms of reference for project management and implementation support consultants; and, (x) prepare cost estimates and financing plan. This TRTA will consult with ongoing TRTA for preparing Water Efficiency Improvement Project in Drought Affected Provinces Project in Vietnam to explore possibilities of replicating drought modeling in the project. A draft will be submitted for ADB and government review and subsequently that will be finalized based on the comments from ADB and the government.

11. **Output 3: Detailed engineering design and bidding documents prepared.** The TRTA consultants' team will comprise design engineers who will do detailed engineering design and prepare bidding documents of the subprojects. The topographic surveys will be carried out for design purpose. Detailed engineering designs reports, drawings, and bill of quantities of each subproject will be prepared and submitted to ADB and the government. The detailed engineering design activities will be financed exclusively by the Project Readiness Improvement Trust Fund (PRITF).

C. Cost and Financing

12. The TA is estimated to cost $2,750,000, of which $2,000,000 will be financed on a grant basis by ADB's Technical Assistance Special Fund (TASF-VI), $500,000 will be financed on a grant basis by the PRITF[9], and administered by ADB. The expenditure items highlighting the cost

[9] Financing partner: Nordic Development Fund.

to be financed by ADB and PRITF are listed in the cost estimate and financing plan in Appendix 1.

13. The government will provide counterpart support in the form of counterpart staff, data collection, office accommodation, appliances, furniture, and utilities and other in-kind contributions. The government was informed that approval of the technical assistance does not commit ADB to finance any ensuing project.

D. Implementation Arrangements

14. ADB will administer the technical assistance. The executing agency has nominated a senior official as Project Director. The proceeds of the technical assistance will be disbursed in accordance with the Technical Assistance Disbursement Handbook (2010 as amended from time to time). Procurements will follow ADB Procurement Policy 2017. The TRTA consultants will organize and implement workshops, trainings and public consultations and provisions for those will be included in their contract as provisional sums.

Table 1: Implementation Arrangements

Aspects	**Arrangements**		
Indicative implementation period	August 2017–June 2019		
Executing agency	Ministry of Water Resources and Meteorology		
Implementing agency	Department of Farmer Water User Communities		
Consultants	To be selected and engaged by ADB		
	Firm, Quality and Cost Based 90:10	157 person-months	$2.15 million
	Individuals	16 person-months	$0.35 million
Procurement	To be procured by consultants		
	Shopping	1 contract	$16,000
Advance contracting	Recruitment of TRTA consulting firm.		
Disbursement	The TA resources will be disbursed following ADB's *Technical Assistance Disbursement Handbook* (2010, as amended from time to time).		
Asset turnover or disposal arrangement upon TA completion	Consultants will hand over the six desktop computers, two printer/scanners and one photocopier to the EA of ensuing project, Ministry of Water Resources and Meteorology		

Source: Asian Development Bank.

15. **Consulting services.** A total of 173 person-months of consulting services (69 person-months of international and 104 person-months of national experts) will be required for project preparation. ADB will recruit the consultants as per the Project Administration Instructions. One consulting firm for 157 person months will be recruited by using quality- and cost-based selection method at a ratio of 90:10 based on a full technical proposal. Four experts including (i) international procurement specialist, (ii) international environment specialist, (iii) international social development/safeguards specialists; and (iv) international gender specialist will be recruited as individual consultant. The purpose mainly is to ensure quality experts with experience of ADB projects are selected upfront because in case of firms quality of such experts has not been up to the mark and replacements take too much time hence delaying the delivery of outputs. Their inputs will also be used for pre-implementation activities post approval of the loan to avoid start-up delays in the ensuing project. All contracts will be input-based with liquidation for each

package. Consulting firm will procure goods comprising office equipment. A list of expertise and person-months required is in Table 2.

Table 2: Summary of Consulting Services Requirement

Positions	Person-Months Required	
	International	National
Water Resources Specialist/Team Leader	12	-
Irrigation Management Specialist	6	12
Hydrologist	6	9
Hydraulic Design Engineer	6	16
Mechanical Engineer	2	4
Structural Design Engineer	3	6
Gender Specialist	2	4
Climate Change(Adaptation) Specialist	2	4
Economist	3	5
Financial Management Specialist	2	3
Agriculture Specialist/Agronomist	3	7
Social Development/Safeguards Specialist	5	7
Institutional Specialist (Irrigation)	3	5
On-farm Water Management Specialist	2	6
GIS/MIS Specialist	3	6
Environment Specialist	3	6
Procurement Specialist	6	4
Total	**69**	**104**

Source: Asian Development Bank.

E. Governance

16. The TRTA will support assessment of financial management capacity, procurement capacity, and risk assessment and management of the executing and implementing agencies. Based on the assessments, measures to address the capacity gaps and risks will be suggested in three separate documents that will form part of the loan documents.

COST ESTIMATES AND FINANCING PLAN

A. Asian Development Bank[a]	
1. Consultants	
a. Remuneration and per diem	1,362.44
i. International consultants	1,044.73
ii. National consultants	317.71
b. International and local travel	72.49
c. Reports and communications	8.33
2. Equipment (computer, printer, etc.)[c]	16.00
3. Workshops, training, seminars, and conferences[d]	74.00
a. Workshops, Consultations	74.00
4. Vehicle[e]	100.00
5. Surveys	90.00
6. Miscellaneous administration and support costs	50.00
7. Representative for contract negotiations	6.00
8. Contingencies	220.75
Subtotal (A)	**2,000.00**
B. Project Readiness Improvement Trust Fund[b]	
1. Consultants	
c. Remuneration and per diem	273.76
i. International consultants	209.92
ii. National consultants	63.84
d. International and local travel	14.57
c. Reports and communications	1.67
2. Surveys	210.00
Subtotal (B)	**500.00**
Total	**2,500.00**

Note: The technical assistance (TA) is estimated to cost $2,750,000, of which contributions from the Asian Development Bank and Project Readiness Improvement Trust Fund are presented in the table above. The government will provide counterpart support in the form of counterpart staff, data collection, office accommodation, appliances, furniture and utilities, and other in-kind contributions. The value of government contribution is estimated to account for about 9% of the total TA cost.

[a] Financed by the Asian Development Bank's Technical Assistance Special Fund (TASF-VI).

[b] Administered by the Asian Development Bank. Financing partner: Nordic Development Fund.

[c] Equipment

Type	Quantity	Cost
Desktop Computer	6	$6,000
Printer/Scanner	2	$5,000
Photocopier	1	$5,000

[d] Workshops, training, seminars, and conferences

Purpose	Venue
Share Inception, midterm and draft final reports with stakeholders	Phnom Penh
Consultations with farmers	Various provinces

[e] Vehicle

Justify the use of and the need to purchase or lease a vehicle	Expected length of use
5 vehicles will be rented for carrying out field work in the project area by the consultants. Since project area will be spread over 3-4 provinces and various teams will be travelling to field, therefore, at least 5 vehicles would be required	12 months

Source: Asian Development Bank estimates.

LIST OF LINKED DOCUMENT

http://www.adb.org/Documents/LinkedDocs/?id=51159-001-TAReport

1. Terms of Reference for Consultants